MARCH '57

MODERN TEXTILES

MAGAZINE

Specializing in Man-Made Fibers and Blends since 1925

FIBERS

FABRICS

FINISHES

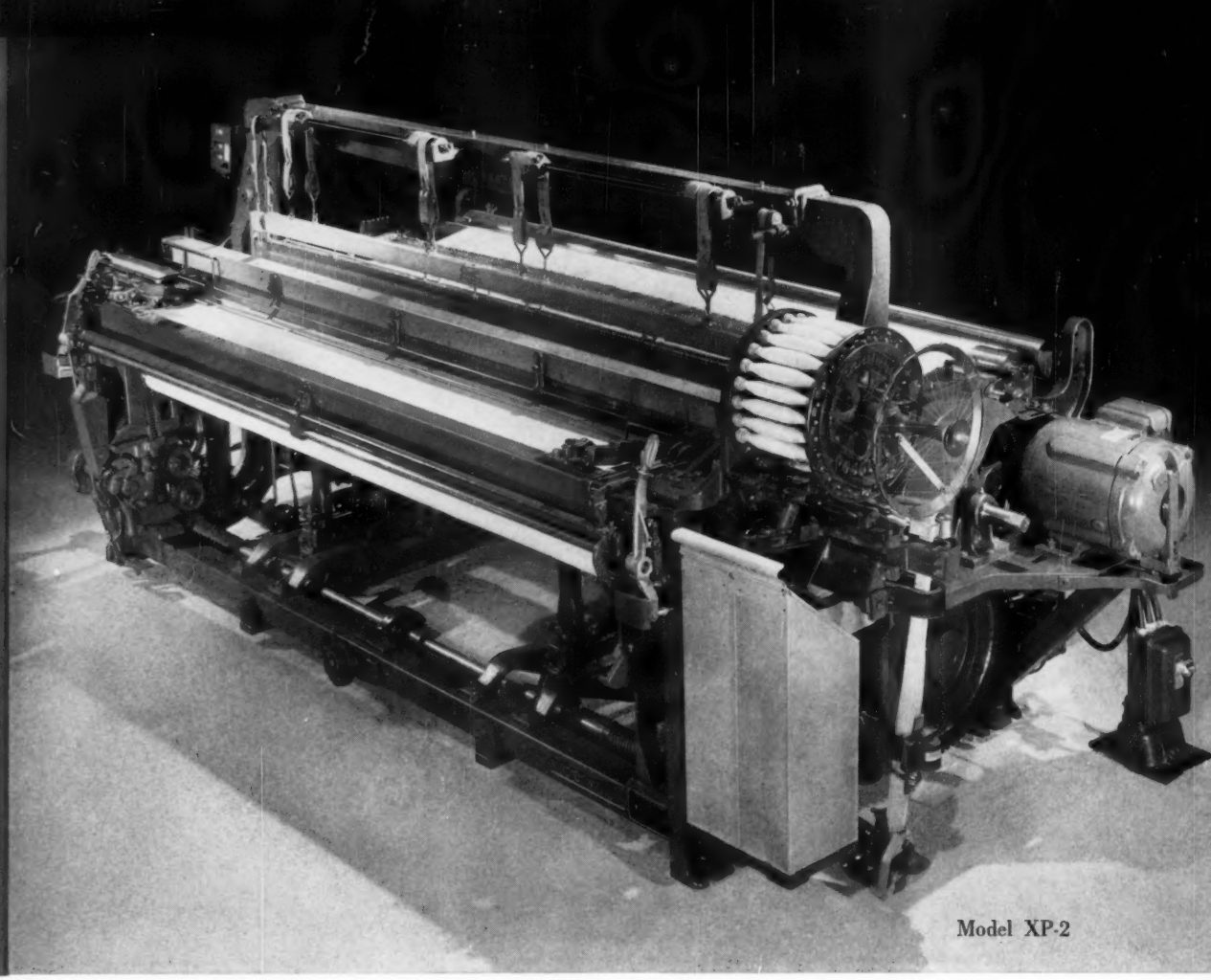
Ponemah's HENRY TRUSLOW teaches an old mill new ways to make fabrics---

Story on page 37

THIS MONTH'S SPECIAL FEATURES

Improved nylon dyeing
New fiber identifying method
Recent improvements in looms
Schreiner calendering of tricot
New pile fabric finishing machines

AND 15 MORE EXCLUSIVE REPORTS AND TIMELY ARTICLES



Model XP-2

Increase Wide Sheeting Production . . . with the new XP-2

New constructions found necessary for higher speeds in other models are now available *for the first time* in a wide sheeting loom.

The Draper XP-2 is equipped with a conventional type Pick Motion, simplified Power Transmitter, Bartlett Let-Off, Worm Take-Up, Easy Shipper and Positive Brake.

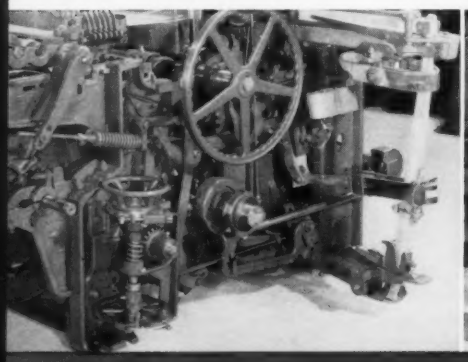
These adaptations mean increased production, greater loom versatility, less downtime and easier loom operation.

Engineered for high speed and efficient performance the Draper XP-2 *offers better profit margins.*

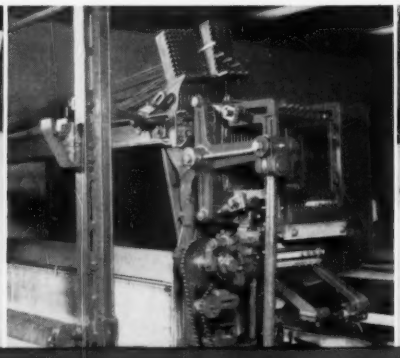
DRAPER CORPORATION

Hopedale, Mass.

Atlanta, Ga. *Greensboro, N. C.* *Spartanburg, S. C.*



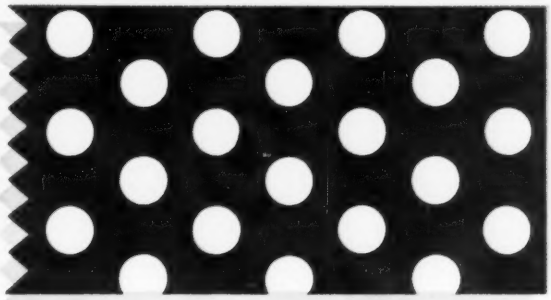
Automatic Bartlett Let-Off



Available with 16 Harness Dobby

Draper-Diehl Drive

use NAPHTHOL DYES by gdc



for deep, brilliant shades — all around color-fastness — high productivity at low cost

Bright reds and yellows, deep rich navies, browns, wines and blacks either too difficult or expensive to achieve with other dyes are simply and inexpensively produced with GDC Naphthols in cotton and rayon, in pad, jig or continuous systems. Acetate, Dacron* and nylon may be dyed by special processes.

Naphthol colors are fast to washing, light, chlorine, alkali and cross-dyeing. Many Naphthols are used as ground colors for discharge printing where wash- and light-fastness are required.

A complete range of highly soluble Naphthol Powders are available. However, for greater economy in high-speed, large-volume operations the prepared liquid Naphtholate AS Solution brands are generally preferred.

The Fast Color Salts and Bases used for development are reliably uniform from batch to batch and most are nondusting for cleaner handling.

Our Technical Service Laboratories are ready to advise you on how to utilize Naphthol dyes in your particular operation.

*Polyester fiber of E. I. du Pont de Nemours & Co. (Inc.)

From Research to Reality

gdc gaf

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A SALES DIVISION OF

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MODERN
TEXTILES MAGAZINE

March, 1957 Vol. 38, No. 3

Modern Textiles Magazine
Established 1925

* * *

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* Registered U.S. Pat. Office.

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Publisher's Viewpoint

Features

AATT Papers

The Principal Trade Groups

Man-Made Fiber Producers Association ..... Empire State Bldg., New York
National Federation of Textiles, Inc. ..... 389 Fifth Ave., New York
American Association of Textile Chemists and Colorists ..... Lowell Techn. Inst., Lowell, Mass.
American Association for Textile Technology, Inc. ..... 100 W. 55th St., New York
Silk and Rayon Printers and Dyers Ass'n of America, Inc. ..... 1450 Broadway, New York
Synthetic Organic Chemical Manufacturers Association ..... 41 E. 42nd St., New York
Textile Distributors Institute, Inc. ..... 469 Seventh Ave., New York
American Rayon Institute ..... 350 Fifth Avenue, New York

Departments

Textile Foundation Dissolved

Liquidation of the New England Textile Foundation, Providence, R.I., was voted by its executive committee to avoid competition with any New England textile school which may decide to conduct its own fund-raising campaigns. Since it was founded in 1944 the foundation has donated nearly $1,000,000 to textile schools. Before liquidating, the foundation will discharge all scholarship obligations now in force and extending into 1960. The funds remaining, estimated at about $75,000, will be divided among Bradford Durfee Technical Institute, Lowell Technological Institute, New Bedford Institute of Textiles & Technology, and probably Textile School of R.I. School of Design. These grants will be made to the schools in direct proportion to their respective textile enrollments.

New Name for Fiber Producers Group

The Rayon and Acetate Fiber Producers Group has changed its name to Man-Made Fiber Producers Association, it was announced last month by Matthew H. O'Brien, chairman. The membership, formerly restricted to producers of cellulosic yarns, is now open to producers of non-cellulosic yarns as well. The membership includes American Enka Corporation, American Viscose Corporation, Beaunit Mills, Inc., Carbide and Carbon Chemicals Company, Celanese Corporation of America, The Chemstrand Corporation, Courtaulds (Alabama) Inc., E. I. du Pont de Nemours & Company, Inc., Eastman Chemical Products, Inc., Hartford Rayon Company, division of Bigelow-Sanford Carpet Company, Inc., Industrial Rayon Corporation, National Aniline Division of Allied Chemical & Dye Corporation, and New Bedford Rayon Division of Mohasco Industries, Inc.

Derby New AATCC Treasurer

R. E. Derby

Roland E. Derby, president of Textile Aniline and Chemical Co. and vice president of the Derby Co., was installed recently as treasurer of the American Association of Textile Chemists & Colorists. He succeeds Albert E. Sampson, of National Aniline Division, Allied Chemical & Dye Corp.

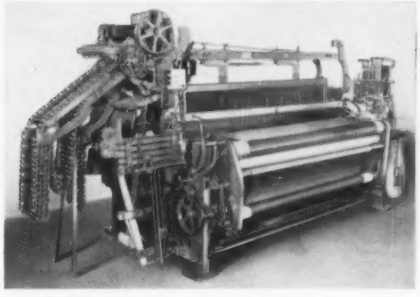
Derby was one of the original group of junior members in the AATCC when it was founded in 1921. In 1953 he was the recipient of the Olney Medal from the AATCC, its highest award.

ASTM To Honor Appel

The Harold De Witt Smith Memorial Medal will be presented to William D. Appel, chief of the Textiles Section, National Bureau of Standards, by the American Society for Testing Materials Committee D-13 on Textile Materials. The award will be made at the committee's Spring Meeting on March 21 in New York City. The late Harold De Witt Smith pioneered in the concept of an engineering approach to the evaluation of textile fiber properties and their utilization. The medal was endowed by Fabric Research Laboratories, Inc., Boston, and is awarded for outstanding achievement in research on fibers and their utilization. This is the eighth time the medal has been awarded.

PLAID NEWS

is GLAD news for everybody



Yes, plaids are back . . . new and stimulating plaids. Just look at the retail ads and you'll see . . . *the lads are going for plaids!*

Here's another of those sudden changes that can catch a weaving mill "in a box" . . . unless that mill is ready and equipped with C&K's W-3 or W-3A fancy automatic box looms and the exclusive Select-A-Pic feature that makes it possible to weave automatically many pick-and-pick fabrics which would have to be woven *non-automatically* on any other type of weaving machinery . . . except C&K's New *PAPA* Loom . . . *about which you will soon hear plenty!*

Make no mistake about it . . . this is a fancy box-loom fabric market . . . and getting more so every day. So if you need the looms to go along with the boom . . . see C&K today!

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Symposium on Newer Fibers

A symposium on acrylic, vinyl and dinitrile fibers will be one of the major events at the 27th annual meeting of the Textile Research Institute at the Hotel Commodore, New York City, Thursday and Friday, March 14 and 15. Headquarters of the institute are in Princeton, N. J.

The opening session on March 15 will have the following program: properties and uses of Acrilan by Frank J. Soday, vice president, research and development, the Chemstrand Corp.; a paper on Creslan by C. W. Bendigo, technical director, American Cyanamid Corp.; a talk on Darlan by Richard B. Smith, of B. F. Goodrich Chemical Co.

During the afternoon session, Dynel will be discussed by J. M. Swalm, Carbide & Carbon Chemical Co. W. W. Heckert, of the Du Pont Co. will talk on Orlon. Data on Verel will be presented by Harry W. Coover, Tennessee Eastman Co. G. W. Stanton, director of research, Dow Chemical Co., will report on Zefran. J. B. Goldberg, textile consultant, will act as moderator for both morning and afternoon sessions.

On Friday, March 15, a number of talks and papers will be presented including a report on new fibers in tire cord by Gerald Mallory, Goodyear Tire & Rubber Co., and a talk on shrink-resistance treatments for wool by Arnold M. Sookne, Harris Research Laboratories, Washington, D. C.

New AATT Appalachian Group to Meet

The first regional group meeting of the American Association for Textile Technology, Inc., outside of New York City, will be held on March 7 in Kingsport, Tennessee. At that time, the newly formed Appalachian Regional Group will gather in a dinner meeting at the Ridgefield Country Club. An attendance of 100 members and guests is expected. The meeting will start at 6:30 P.M. with a social hour, followed by dinner at 7 P.M. Admission is $3.00 for AATT members and $3.50 for non-members. Frederick E. Anderson, acting chairman of the Appalachian Group, extends a warm invitation to non-members interested in textiles to attend the meeting.

At the meeting, Clifford Karnes, head of quality control at Burlington Industries, will deliver a talk on quality control. Gerard K. Lake, Burlington Industries, president of AATT, will come from New York City to preside. He will deliver to the membership of the Appalachian Chapter a copy of a recent resolution by the Board of Governors of AATT approving the formation of the Group, and on behalf of AATT he will present the Group with an official AATT banner to be displayed at its meetings.

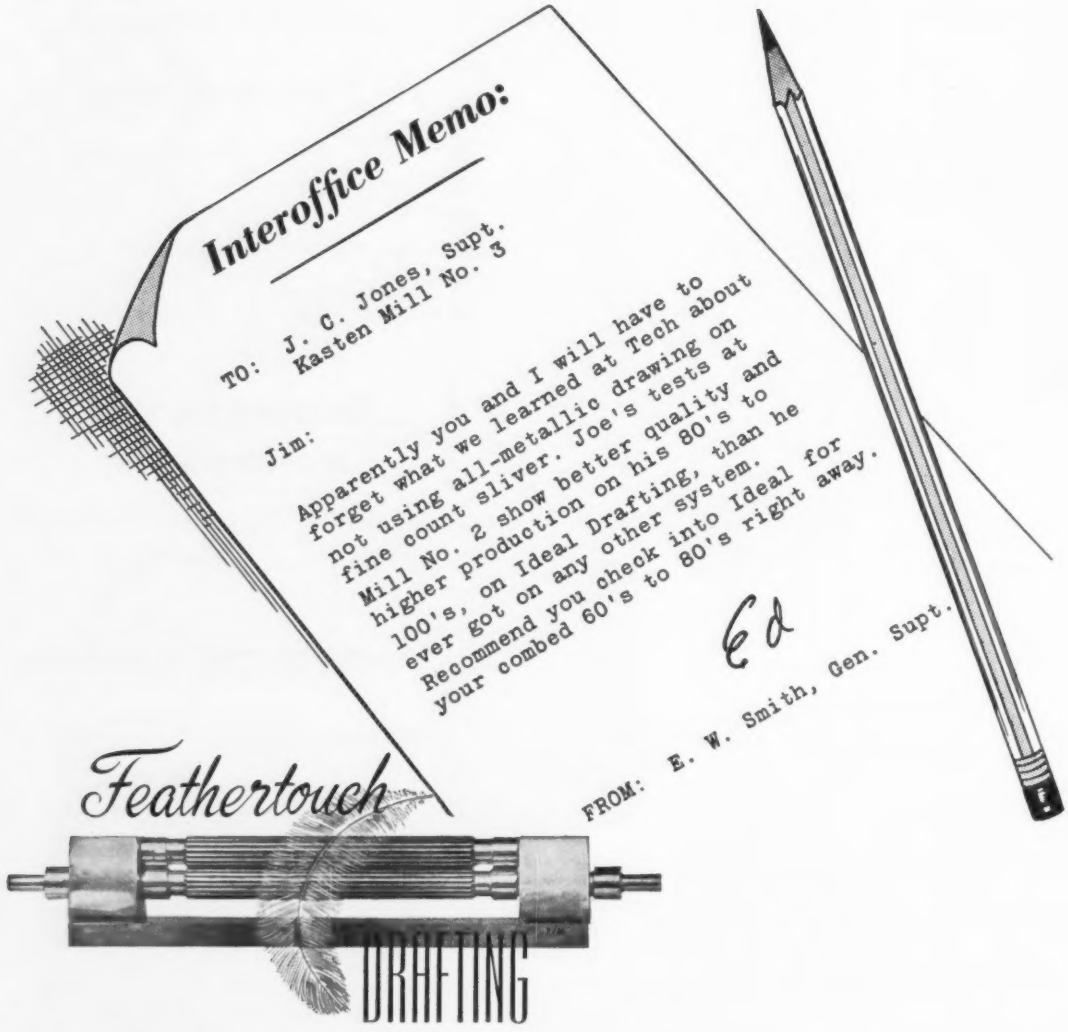
Membership in the Appalachian Group at present is drawn largely from the Kingsport-Elizabethton-Johnson City area in Tennessee. Wendel Faw is chairman of the membership committee; Glenn Counts chairman of the nominating committee; Dr. Emmett Martin chairman of the program committee. Richard Forrester is acting secretary-treasurer.

Final Plans Shaped for Knitting Show In Atlantic City April 29 to May 3

More than 220 exhibitors have already signed up for space at the 43rd Knitting Arts Exhibition to be held in Atlantic City, N. J. April 29 to May 3. Advance indications also point to a record attendance at the show which will present one of the most comprehensive displays of knitting and knitwear production equipment and supplies ever assembled.

(Continued on Page 68)

Yes, we said "Fine Counts"



Some mills, which were successfully using Ideal Feathertouch Drafting on carded stock, hesitated to use it for fine counts and for combed yarn because of former prejudice against using metallic rolls on fine counts. Those who conducted tests have uniformly made reports like the one above. Today many of the largest and finest mills are running *all* of their finest counts on Ideal Feathertouch Drafting.

Ideal's patented ball bearing spacing sections keep the rolls perfectly aligned at all times. Free-floating fluted top rolls give only a light feathertouch to the stock. They automatically even out thick and thin places in the sliver and impart a permanent crimp. Ideal High Speed Ball Bearing Drawing* cannot bruise, crush, or cut fibres. Even on the finest counts, Ideal Feathertouch Drafting gives you the highest quality drawing sliver. And Ideal Feathertouch Drafting costs less to buy, less to run, and less to maintain. Write for full information today.

*Patent Nos. 2,610,363; 2,490,544; 2,412,357. Other patents pending.

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A BEMBERG RAYON YARN CREATION

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From now on . . . with a brilliant new yarn and a little design originality . . . it's a cinch to cook up a new fabric sensation.

We have that new yarn . . . FLAIKONA!

FLAIKONA is the only continuous filament flake yarn ever perfected. It achieves a spine-tingling two-color effect with a single dyeing process. It produces a new dimension in texture . . . a wonderful shantung-type weave that's irresistible and fashion-right in everything from men's and women's wear to draperies and upholstery. It introduces a new standard of practicality in high-fashion fabrics with the precious fibre look.

If you're ready with your fabric recipe . . . we're all set with the yarn. Just call LExington 2-3520!

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ARISTOCRAT OF RAYON YARN

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THE TEXTURED YARN MACHINE!

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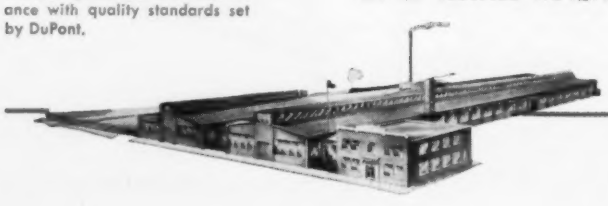
Watch for a big spurt in textured yarns . . . 60-spindle U. S. ACME TEXTURIZERS are now in production on "TASLAN"* textured yarns at DuPont licensees!

The new U. S. ACME TEXTURIZER introduces a whole new quality and profit approach to textured yarn production. It's designed for both the wet or dry process of texturizing twisted or untwisted filament yarns from cakes, cones, pirns, etc., to new, bigger, uniform headless packages—ready for quilling or warping!

In typical U. S. ACME tradition, this new machine provides positive yarn feed control, simplicity of threading, accurate tensioning—and more! Complete information is available . . . write or phone now.

U. S. TEXTILE MACHINE CO. • Scranton 8, Pa., U. S. A.

*"TASLAN" is DuPont's registered trademark designating textured yarns made in accordance with quality standards set by DuPont.



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designers and manufacturers of
U. S. ACME MODERN THROWING EQUIPMENT

only nylon carpeting offers so many advantages

BEFORE...

DURING...

and especially

AFTER the sale!

You are selling positive performance characteristics when you sell nylon carpeting. It's sound merchandising for you, and true value for your customer, when you offer the performance pluses that make nylon today's best buy in carpeting.

HERE THEY ARE:

1. **Permanent Textures.** More *permanent* than wool, cotton or rayon.

2. **Resists Abrasion and Scuffing.** Will out-wear comparable carpeting made from *any other* fiber.

3. **Resists Crushing and Matting.** More crush resistance and less matting than comparable wool, rayon or cotton floor coverings in service.

4. **More Resilient.** More resilient than comparable wool, rayon or cotton floor coverings after continued usage.

5. **Cleanable.** Nylon is an easy-to-care-for fiber. The round, smooth nylon fibers prevent dirt from clinging. May be spot-cleaned and shampooed. Dries quickly.

6. **Economical.** The strongest and toughest of all carpet fibers, nylon will out-wear comparable wool and rayon fabrics, thus be actually less expensive in the long run.

7. **Mothproof, Insect-Resistant.** Never a worry about moths! Carpet beetles cannot attack nylon carpeting.

8. **Decorator Colors.** Nylon can be dyed in lasting colors and an attractive range of shades.

Any reliable manufacturer can deliver these benefits in carpeting made from 100% IRC NEW NYLON fiber. In addition, manufacturers can, and are delivering superior carpeting using respectable percentages of nylon and featuring many of the pluses listed above.

THE NEW Nylon Staple I·R·C

INDUSTRIAL RAYON CORPORATION, Sales Offices: 500 Fifth Ave., New York 36, N. Y. 627 Guilford Bldg., Greensboro, N. C.

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FOR DEPENDABLE, UNIFORM
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For positive color uniformity from top to toe—in lot after lot—you can't beat VIBRATOL!

VIBRATOL is a safe and dependable dyeing assistant and leveling agent that gives yo beautiful, even tones between multi-filament and the mono-filament, every time.

VIBRATOL gives hosiery sales stimulating eye appeal . . . it keeps customers satisfied with their purchase . . . it helps you reduce rejects.

For help with all your finishing and dyeing problems, call or write Fancourt today.

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When the AVISCO® says washable

your rayon apparel sells and stays sold!

Many people don't realize what tremendous advances rayon fibers and rayon finishes have made in the past year or two.

The Avisco Integrity Program has been set up to consolidate these gains, explain them and build continuing public confidence in them.

Washable rayon apparel, for instance, offers a tremendous new volume potential for the retailer. For now the true colors, the lasting luster and the luxury look of fine rayon can be sold as "washable" without a qualm. Even white rayon business shirts offer important sales advantages.

You can have confidence in apparel bearing the "washable" Avisco Integrity Tag because every qualified fabric has passed these eight tests:

1. Colorfast to machine laundering in HOT water (160° F)
2. Colorfast to sunlight (test: 40 Fade-Ometer hours)
3. Colorfast to crocking
4. Shrinkage less than 2% (test: CCC-T-191a, cotton method)
5. Resistance to atmospheric fumes (such as smog)
6. Resistance to retained chlorine (measured by loss in fabric tensile strength)
7. Breaking strength (A.S.A. test L-22)
8. Bursting strength (A.S.A. test L-22)

For further details, call LA 4-7200 or write

AMERICAN VISCOSE CORPORATION, 350 Fifth Avenue, New York 1, N. Y.

Life changes... so must fibers and fabrics

The *best* solutions to current fabric problems are *contemporary* fibers.

On these pages you see listed nine of them—part of Celanese' constantly expanding answer to today's specialized fabric needs.

Engineered to specific end-uses, these modern fibers have influenced every area of fashion, home furnishings and industry. They combine modern talent and old fashioned integrity. You can depend on them every stitch and step of the way.

If you too believe the alternative to falling behind is thinking ahead, we invite you to *go contemporary with Celanese.*

Celanese Corporation of America, New York 16, N. Y.

ARNEL the new triacetate fiber for easy-to-care-for lingerie, apparel and curtainings.

ACETATE the beauty fiber for elegant dress fabrics, sportswear, men's shirtings, home furnishings fabrics.

CELAPERM the acetate yarn with "sealed-in" color for bathing suits, sportswear, children's clothes, home furnishings.

BULKED ACETATE new bulked filament yarn brings a lofted look to home furnishing and upholstery fabrics and men's, women's and children's apparel.

CELACLOUD the light, springy new acetate bedding fiber is taking over in pillows, comforters, mattresses.

QUILTICEL permanently bonded acetate interlining holds its shape in all quilted outerwear, loungewear, and infants' wear.

FORTISAN super-strong rayon for home furnishing sheers; adds strength to decorative fabrics.

FORTISAN-36 high strength heavy denier rayon specifically engineered for industrial uses such as high pressure hoses, V-belts, tarpaulins.

RAYON the versatile yarn—at a most welcome price.

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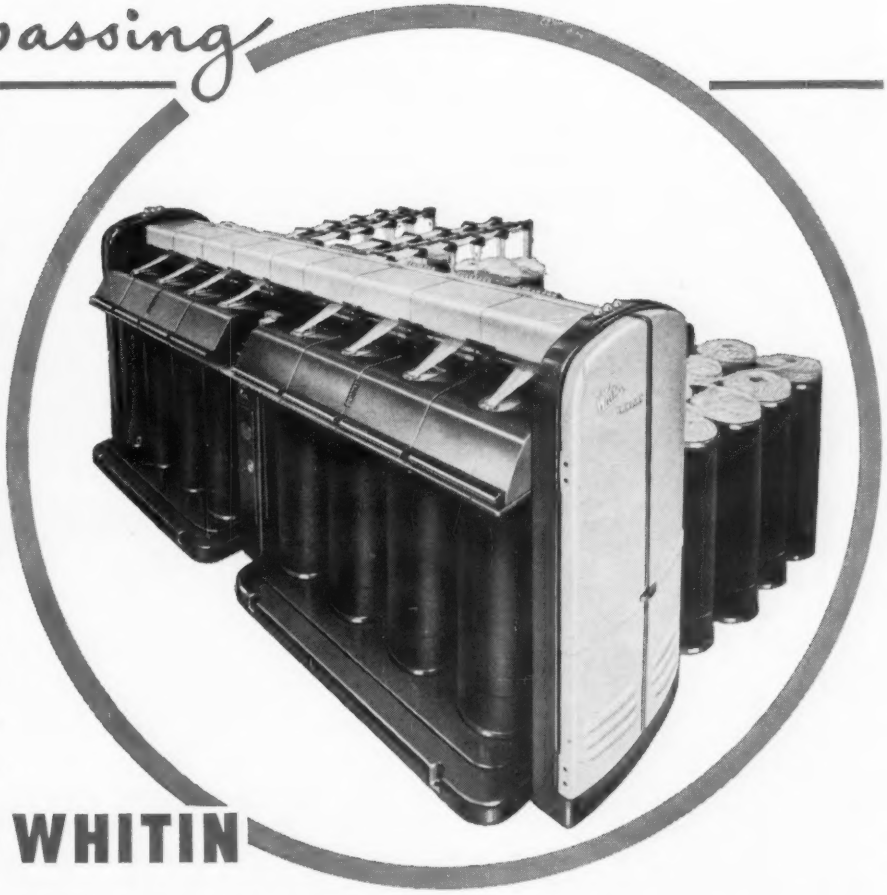
Celanese CONTEMPORARY FIBERS

Surpassing

all present-day standards of drawing . . . .the New WHITIN



EVEN-DRAFT* Drawing Frame

Seldom has any new textile machine had so pronounced an impact,—been so definitely successful — as the new Whitin Even-Draft Drawing Frame. In many large installations (up to 80 deliveries), mills report production doubled or tripled, sliver quality reaching levels formerly unattainable, and costs slashed to new lows. In short, all current standards for drawing have been completely surpassed by this new Whitin high production, precision-made textile machine.

● **From 250-300 feet per minute Front Roll Delivery**

Production two to three times more than conventional machines, depending upon mill conditions and production needs.

● **For all fibers up to 3"**

The first universal drawing frame — for cotton, spun synthetics and blends.

● **Outstanding Sliver Quality**

Improved uniformity in both carded and combed sliver — 6 or 8 ends up.

● **Pneumafil Clearer Units**

A brand new way of removing waste fibers. Developed for, and an integral part of, this machine.

● **Entirely New Design**

Two independent four-delivery heads, vibration proof construction; precision tolerances; anti-friction bearings; unique four over five roll drafting; new overarm weighting; no-twist can table; electronic stop motions and signal lights; 14" — 15" — 16" cans, 36" or 42" high.

*TRADE MARK

WHITIN MACHINE WORKS FOR 125 YEARS ONE COMPANY WITH ONE PURPOSE SERVICE TO THE TEXTILE INDUSTRY 1831–1956

Whitin MACHINE WORKS

WHITINSVILLE, MASSACHUSETTS

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FOR TRUCK TARPS—waterproof-coated nylon provides greater cargo protection, versatility and economy.

FOR FIELD COVERS—flexible, easy-to-handle covers of coated nylon can be brought into position quickly.

FOR CONSTRUCTION COVERS—rugged, lightweight coated nylon for a variety of on-the-job uses.

Today, more and more businesses use covers of coated nylon

FOR LIFEBOAT COVERS—durable, mildew-resistant, coated-nylon covers have long service life.

FOR EQUIPMENT COVERS—coated nylon gives extra protection to valuable equipment.

FOR WADING POOLS—colorful coated nylon is resistant to rot and mildew and gives long service.

That's why tomorrow's leaders are using coated nylon today!

Business is constantly finding new uses for coated-nylon tarps. Most major-league ball fields are covered with them, oil companies cover rigs with them and many summer-theatre groups play under thousands of square feet of coated-nylon tent.

No wonder sales of coated-nylon tarps have gone up over 150% in one year. Forward-thinking fabricators constantly see new sales opportunities for covers of coated nylon. Now's the time to get your part of this ever-growing market.

If we can help you with fabrication information or a list of suppliers, write: E. I. du Pont de Nemours & Co. (Inc.), 4531 Nemours Building, Wilmington 98, Delaware.

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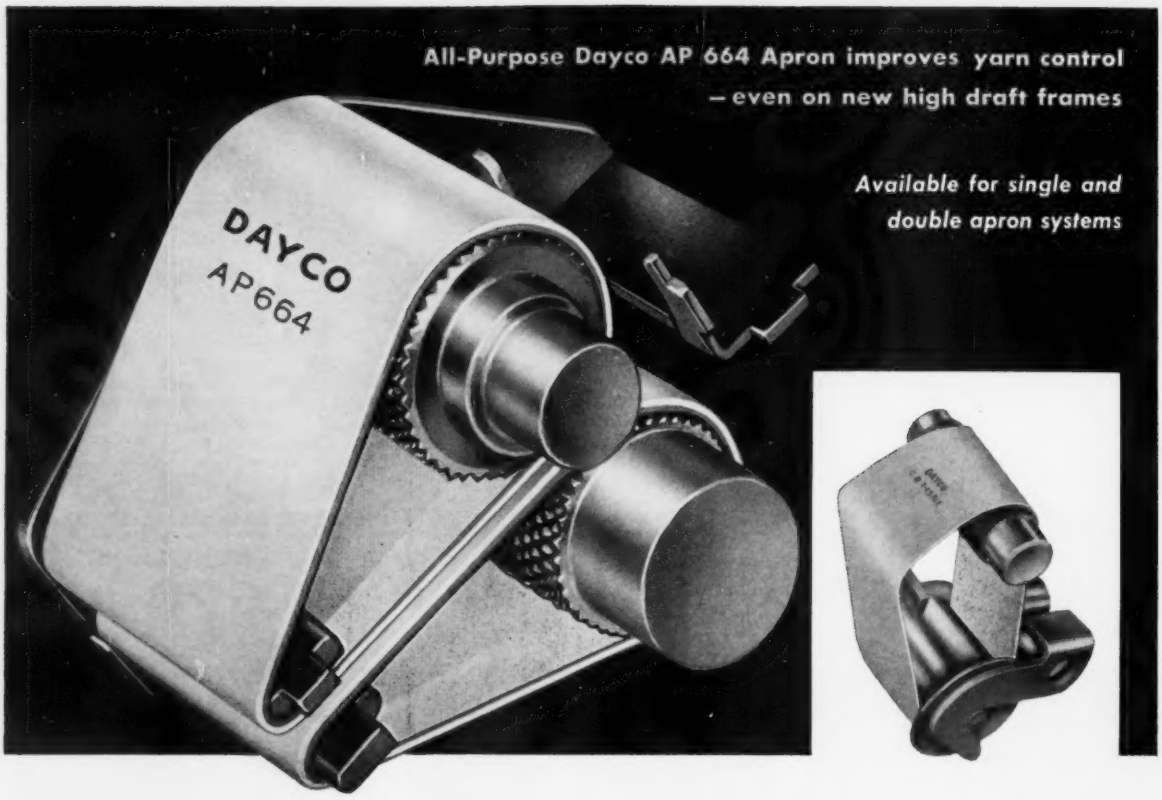
BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

COATED NYLON—long-wearing . . . easy to handle . . . lightweight . . . waterproof . . . resistant to rot and mildew



New Dayco AP 664 Apron

Improves yarn uniformity at all drafts

You'll see a remarkable increase in the uniformity of your yarn — on low, high or super draft frames — when you switch to Dayco AP 664 Aprons.

At high drafts, variations in apron speed have a detrimental effect on yarn uniformity. That's why the new Dayco AP 664 construction incorporates special properties to minimize speed irregularities.

Greater flexibility eliminates drag around the nose bar. Reduced co-efficient of friction in the satiny, pink, inner surface reduces chatter — an indication of jerky, uneven flow around the nose bar. Extremely pliable, *non-stretch* cord body adds *extra* assurance of uniform apron tension for constant, even, yarn control at all drafts.

Special light blue compounds in the drafting surface handle natural or synthetic fibers with equal ease. Non-glazing, they keep their ideal face all through their long service life. They are not affected by any known oils, or extremes of heat or humidity. So trouble-free Dayco Aprons keep drafting costs low, help keep production high.

Your Dayco Representative will be in to see you shortly. Ask him about the superior drafting you'll get with new Dayco AP 664 Aprons. Or write direct to The Dayton Rubber Company, Textile Division, 401 S. C. National Bank Building, Greenville, S. C.

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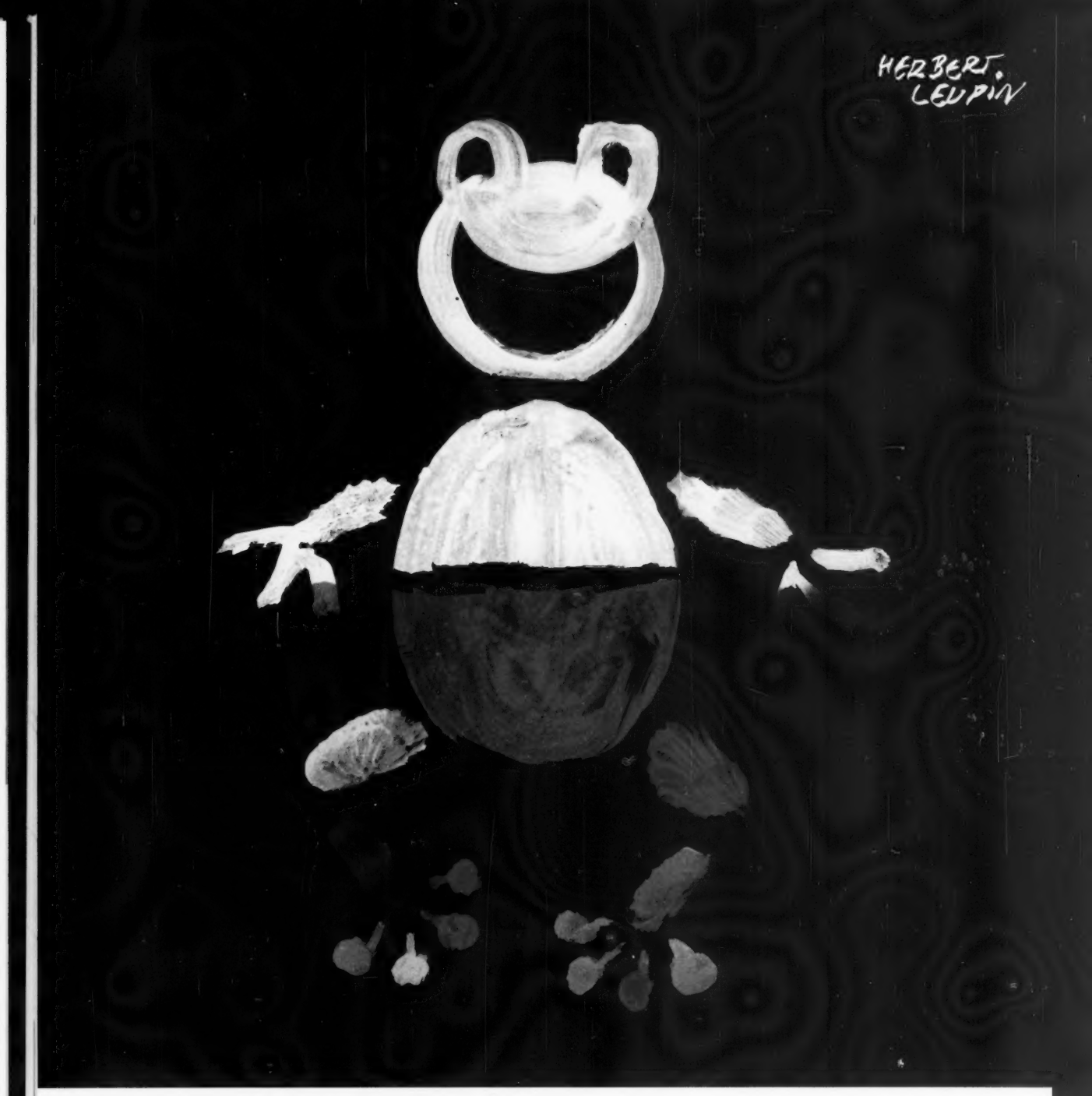

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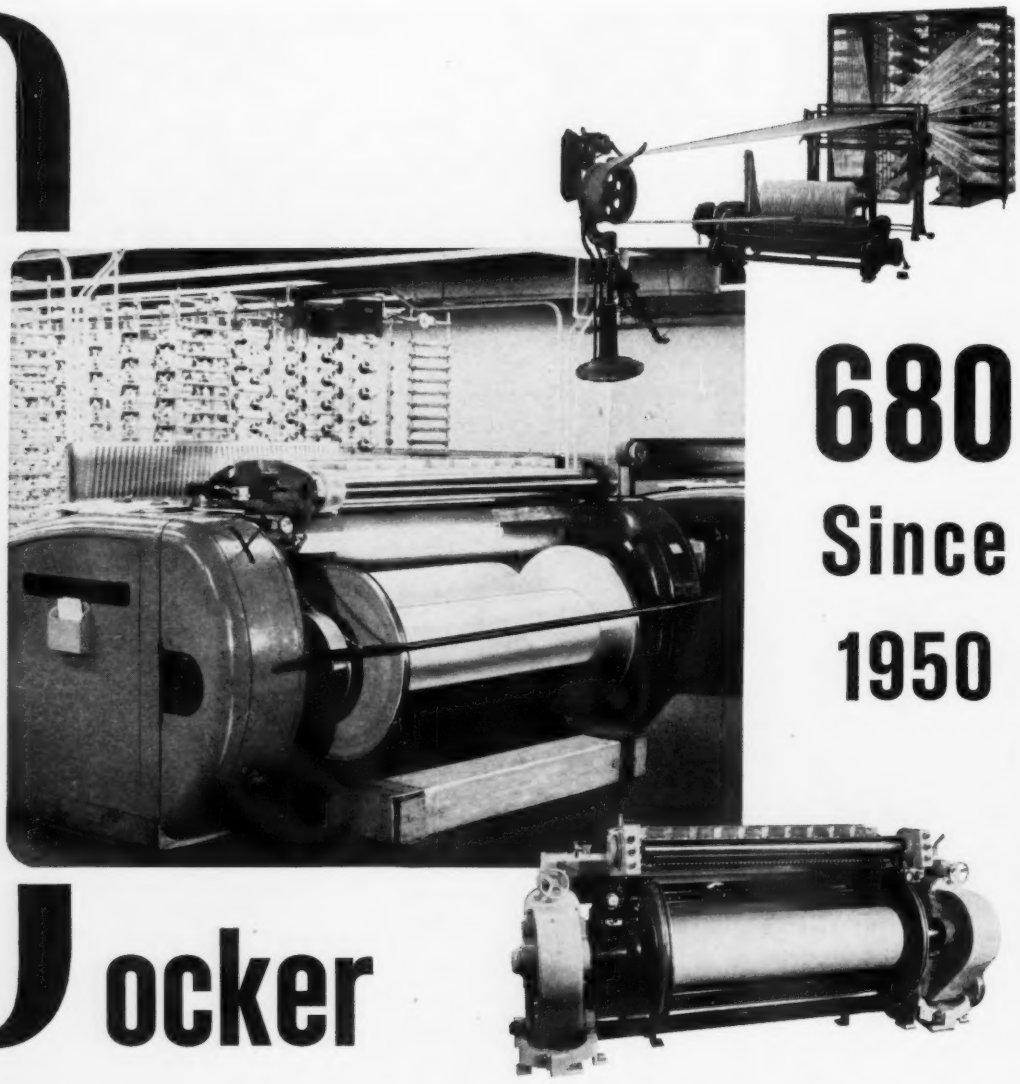

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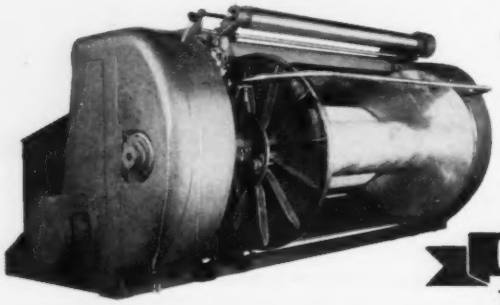

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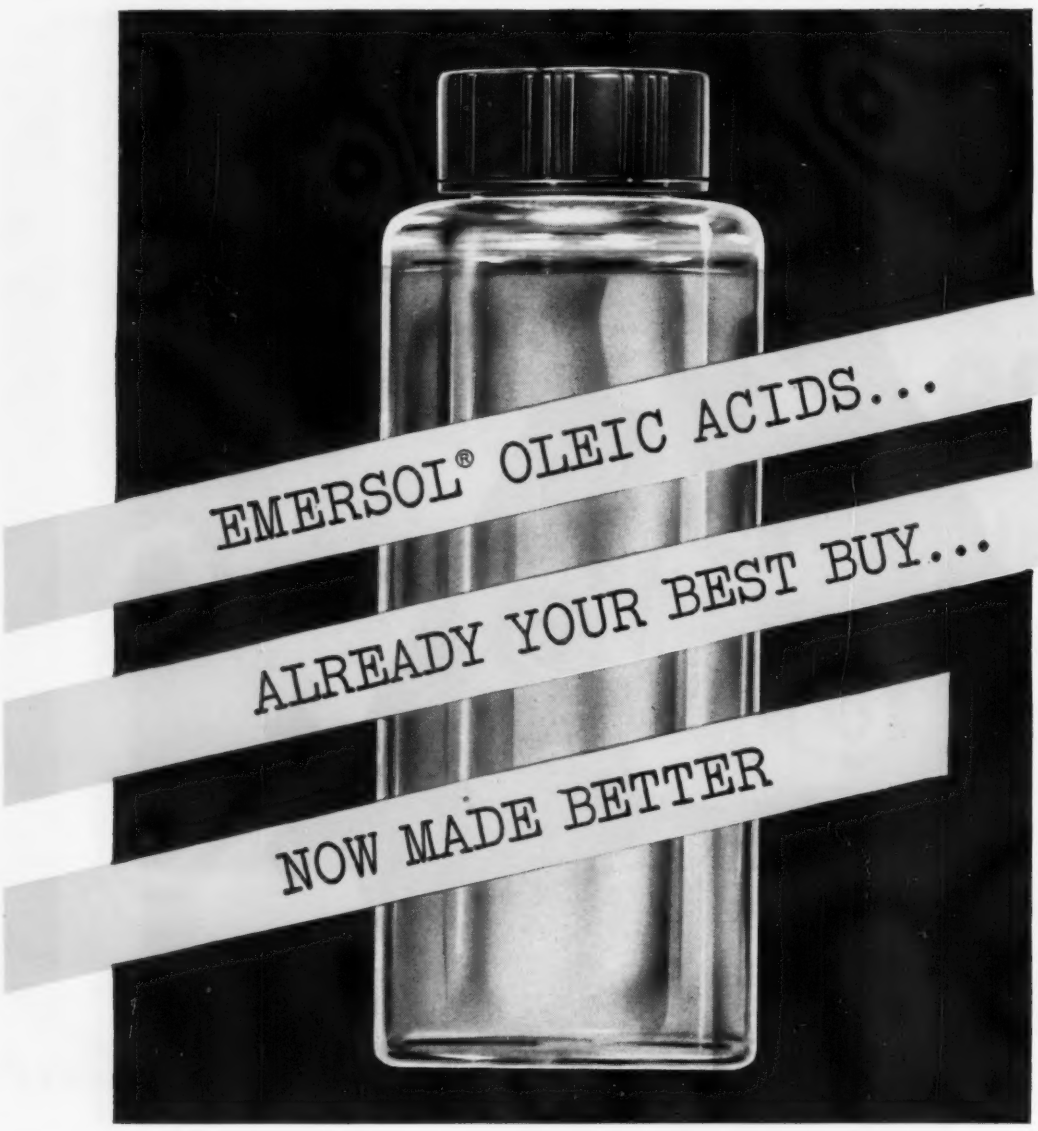

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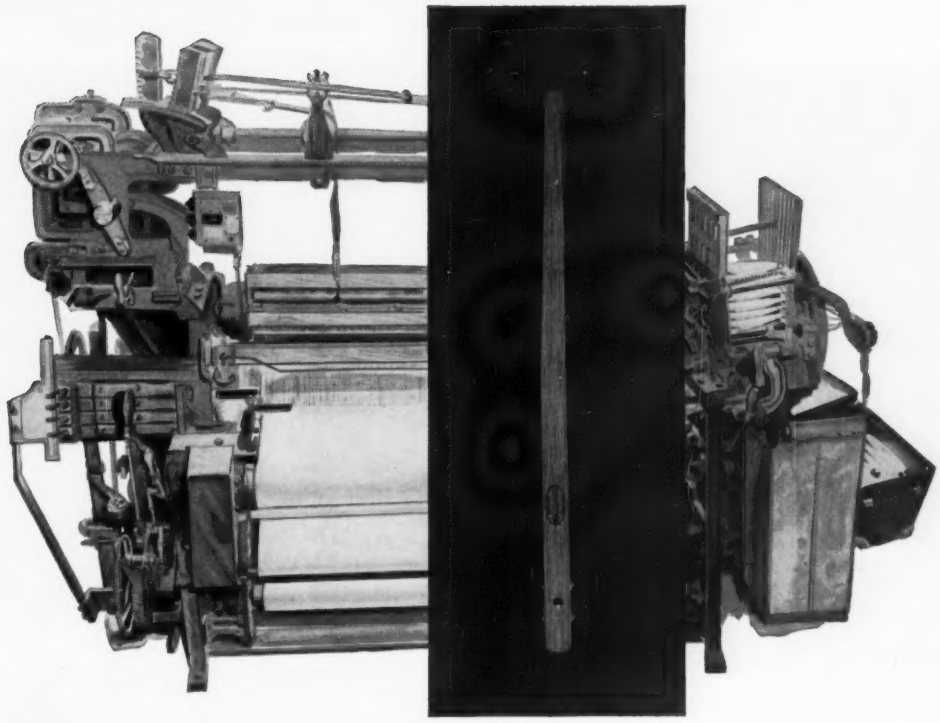

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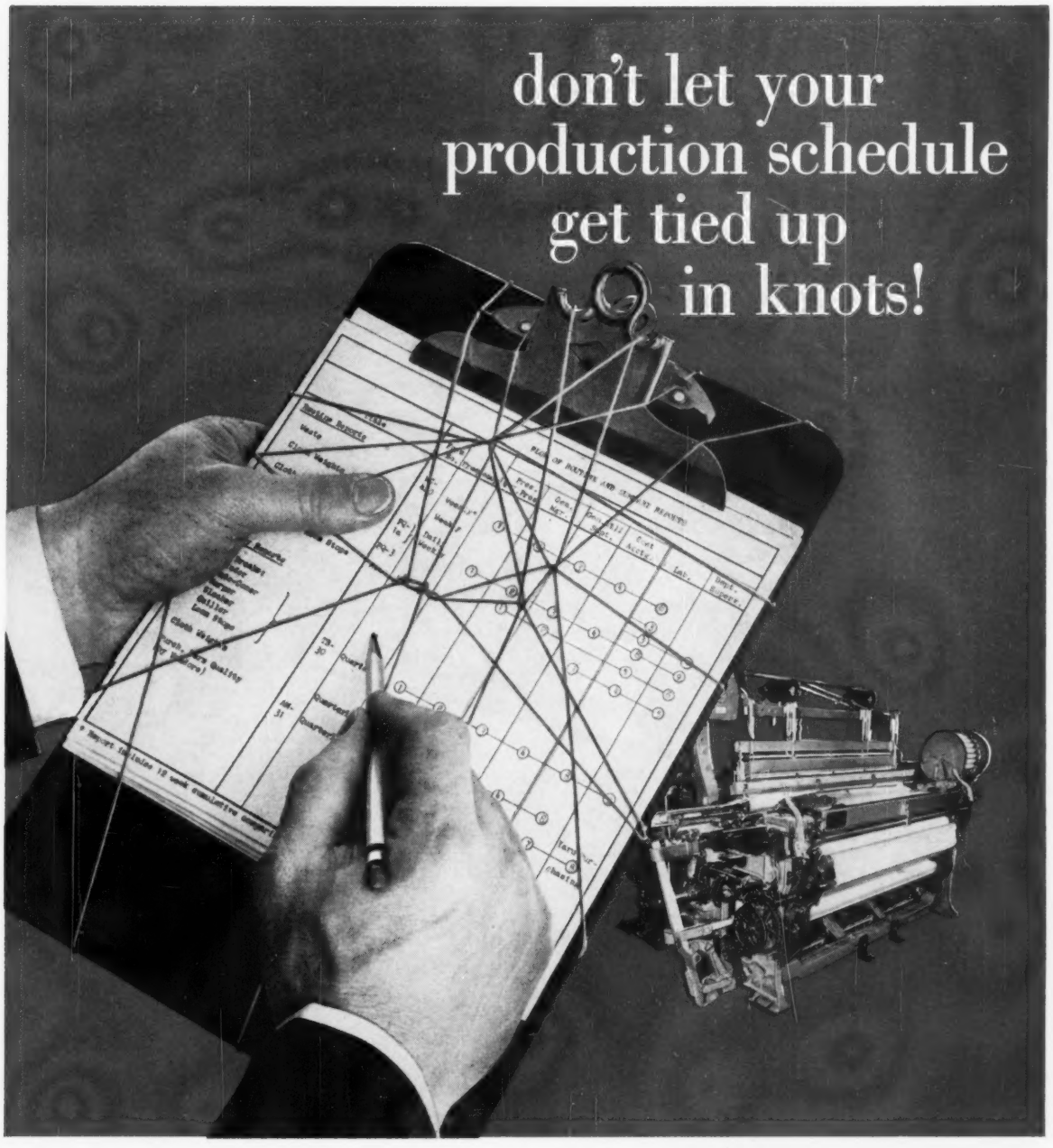

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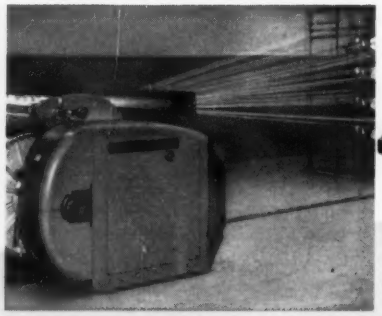

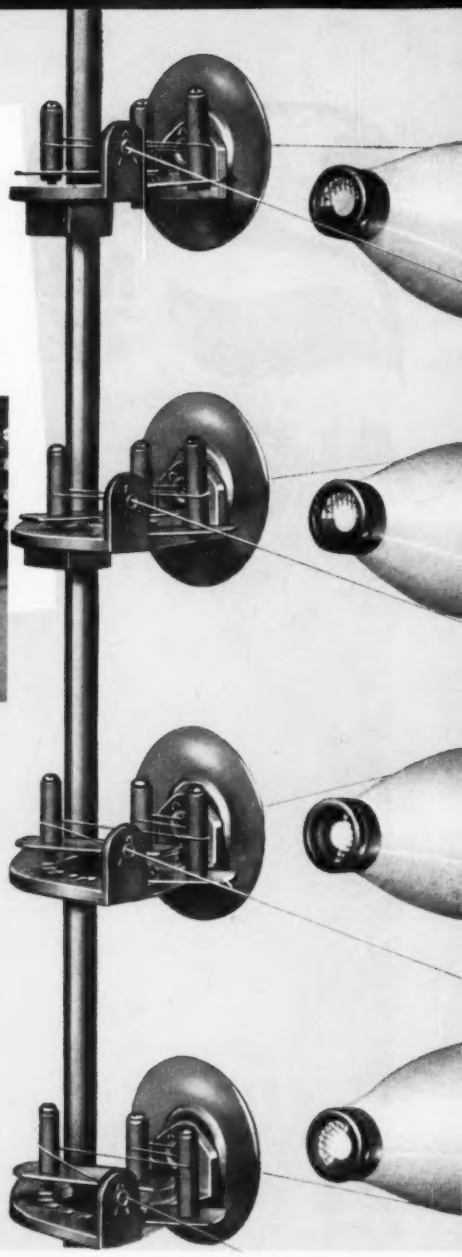

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MODERN
TEXTILES MAGAZINE

March 1957
Volume 38 Number 3

Publisher's Viewpoint

Never Too Late to Mend

That man-made fibers can be promoted effectively by group effort was demonstrated last month when the American Rayon Institute staged a convincing style show in New York City previewing crepe and chiffon dresses expected to be worn in coming months. The fact that a promotional organization whose efforts are limited to only one type of man-made fiber can be so effective when its energies are wisely directed is cause for reflection. It is reasonable to believe how much more effective would be promotional efforts of this kind if they were presented on an industry-wide basis and embraced fabrics made will all man-made fibers.

For example, in the case of crepe fabrics, rayon is widely used in combination with acetate. To talk about the advantages of rayon in these fabrics without mentioning acetate is a one-sided and lame approach. In other words, it should be clear by this date that the fate of all the man-made fibers are tied in with each other. It is not easy to promote the values of one (whether it be rayon or nylon or any other fiber) as if that fiber alone existed.

Although observations of this kind have often been made on this page, to repeat them now has a special timeliness in view of the current withdrawal of a number of sponsors from the American Rayon Institute with a consequent reorganization of its promotional efforts on a reduced financial scale.

With the Institute reorganizing itself an opportunity is presented for all concerned to make a friendly, nevertheless unblinking evaluation of the Institute's weaknesses as they have been demonstrated in the first three years of its work. One weakness that has been outstanding is the Institute's concentration on advertising as a means of achieving its ends. In confining its work largely to expensive advertising campaigns in consumer magazines, the Institute has been duplicating, quite unnecessarily, the advertising efforts conducted individually by its sponsoring yarn producers.

And in functioning more like an advertising agency than a promotional organization the Institute has been neglecting, to a large extent, the work it might well have done with more benefit to rayon— we have in mind work with teachers' groups, schools, consumer organizations—to name only a few of the fields where honest, informative material about rayon is in demand.

Nevertheless, the experience accumulated by the American Rayon Institute, no matter how limited, need not be wasted effort for the man-made fibers industry. With all its weaknesses, its highly regrettable limitation to one fiber, the Institute has shown in such events as last month's fashion show, that group action by fiber producers can be effective.

The great task ahead for our industry is to make such group action more effective by broadening it to include all man-made fibers and all man-made fiber producers; by getting out of the easy work of buying advertising space in magazines and by getting into the difficult, and tremendously varied work of true consumer education on the useful properties of man-made fibers.

Our industry has delayed a long time in undertaking this urgent task. But it is part of the consoling wisdom of life that, in most matters, it is never too late to mend. Our industry has still time to accept its responsibility toward the public by creating a strong trade organization that will do all that must be done to serve the public, and create expanding markets for all man-made fibers.

A. H. McCullough

PUBLISHER

OUTLOOK IN TEXTILE MARKETING

By ROBERT C. SHOOK, Textile Economist

Poor finishing plagues cottons as well as man-mades; Choosy consumers inspire rise in quality standards

Time after time, the chemist or the textile technician perfects a new finish or a new process, which substantially improves the quality of the fabric. It is always a shock to find that the cutter is sometimes unwilling to pay the additional cost, even when it is only a cent or two a yard.

Those new in the textile field are also shocked at the means used to cheapen a successful fabric, and bring it into volume price ranges. Cost reductions in some cases can be legitimate, in the sense that the modified fabric may still have good serviceability. A silk warp, for example, might replace an acetate warp, producing a closely related fabric, which is still satisfactory to the consumer, at a lower price.

What usually "kills" a fabric, however, is the other kind of cheapening, which involves a reduction of ends or picks, a short cutting of finishing methods, or substitution of cheap dyes for more expensive ones.

Cotton Standards Were Observed—For some time past, cotton fabrics seemed to be less subject to cheapening in the worst sense of the word than man-made fiber fabrics. There were a number of reasons for this. For cottons, which had served for centuries as utility fabrics, standard constructions were well established, and well known to buyers. For many years, Sanforizing was a patented process, and was carefully policed. This did a great deal to establish the reputation of cotton fabrics as being washable.

Furthermore, finishing processes were much less complex 20 years ago than they are today. While it is possible now to impart a greater variety of desirable qualities in finishing a fabric, at the same time the temptation to save a cent or two a yard in the finish has been substantially increased.

Man-Mades Are Doing Better Now—There are many indications that poor quality finishing is more of a problem for cotton fabrics today than it has been in the past, and that this is beginning to have some effect on the popularity of cottons as compared with man-made fabrics in many end uses. It is not so much that man-made fabric finishing has come up to the earlier levels maintained for cotton fabrics, but that finishing of cotton fabric has been coming down to lower levels which were too frequently witnessed in man-made fabrics. However, there have also been important developments in man-made fibers—solution dyed fibers, bulk fibers and new finishes—which have had a positive value, and which have encouraged a better level of fabric quality as well as styling.

* * *

Times Are Not Easy for Textiles—1957 is shaping up as a challenging year for all textiles. Although retail sales generally have continued favorable, activity in wholesale markets has been somewhat disappointing. To some extent this is due to the later Easter. Nevertheless, the industry is not showing the vigor that it has in many preceding textile cycles.

On the positive side, there seems to have been a revival—in technical development, in styling, and in many cases in fabric quality—in the man-made fabric end of the business. Combined with some deterioration in quality for cotton fabrics, man-made fabrics are beginning to make a better showing in some important end uses. This was evident in blouses in 1956 for example, and it will be interesting to watch the results of Spring retail sales in other departments this year.

(Continued on Page 60)

Vice president and research director, A. W. Zelomek Associates, Inc., 350 Fifth Ave., New York City.

Celanese's big new laboratories

They are equipped for mill-scale pioneering work for new, better fabrics

STAFF PREPARED

NEW development laboratories broadly equipped to give practical help to fabric manufacturers were opened last month in Charlotte, N. C., by Celanese Corp. of America. The textile yarn and fabric manufacturing sections of the new laboratory are housed in the basement of Celanese's big new office building which serves as headquarters for the company's textile division.

The dyeing and finishing sections of the new laboratories are located in a new structure built for this purpose. An additional new building has been completed, but not yet equipped, to do the work of developing economical processes for manufacturing new yarns and fibers. The two new buildings are located on a 114-acre site on Reid Road, two miles from the headquarters building.

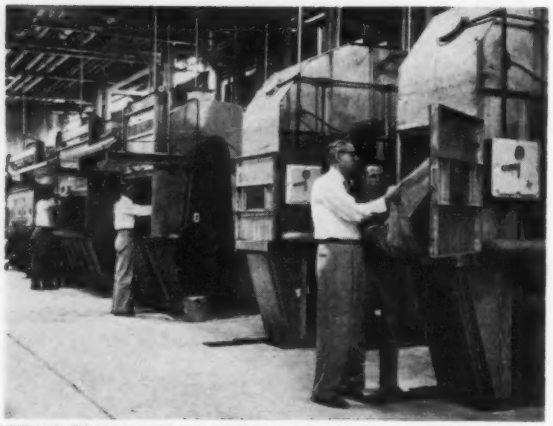
The new fiber and textile development center provided by the three new laboratories consolidates trained workers and facilities which previously had functioned in a number of different localities. The total floor area of the new laboratories is approximately 160,000 square feet, and they have been built and equipped at a cost of millions of dollars, Celanese president Harold Blancke said.

Virtually every type of yarn preparation and weaving equipment is installed in the roomy basement laboratory. Actual plant size machinery units are employed so as to permit spinning, weaving and knitting development work under realistic mill conditions. A special section of the laboratory is equipped with a wide range of machinery for the manufacture of nonwoven fabrics, including the development of such industrial fabrics as filter cloths.

THE TREND IS TO BLEND—This Whitin sliver lapper is an example of the full-size, production-type equipment used in the new Celanese laboratories. It is employed in experimental work with acetate and Arnel staple.

DOES THE FABRIC MEASURE UP?—Fabric passing through the measuring mechanism as it emerges from the Famatex drying machine in the dyeing and finishing laboratory.

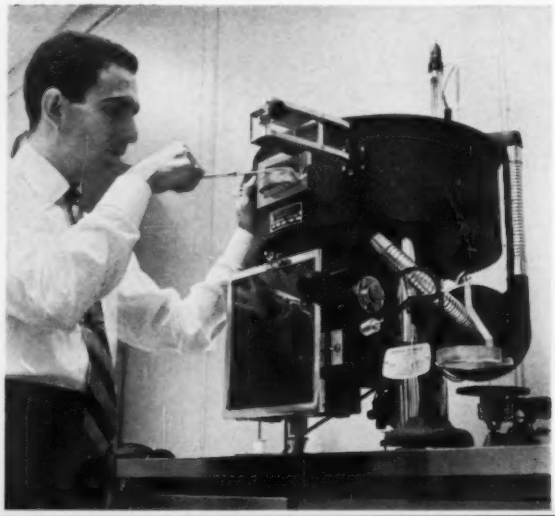
TRY THIS ONE FOR SIZE—This big eight-can Cocker slasher is used in sizing and yarn lubricant experimental work in the new laboratory.



DYEING EQUIPMENT IN ACTION—This battery of dyeing winches is part of the extensive equipment in Celanese's new dyeing and finishing laboratory.

THE HEAT'S ON—Because heat setting is so important in finishing Arnel triacetate fabrics, the new Celanese laboratory is equipped with the latest machinery for this purpose. Here is a Morrison heat setter for use on Arnel and other hydrophobic fibers.

EVALUATION IS ALSO IMPORTANT—Fabric development at the new Celanese laboratories is supported by painstaking work in the testing and evaluation section. Here a technician is working with a Brabender Moisture Tester.



The yarn and fabric development work is supported by a comprehensive laboratory for testing and evaluation of materials at every stage of the textile manufacturing process. This is located on the second floor of the headquarters building.

The dyeing and finishing laboratory on Reid Road is equipped with a wide range of commercial type machinery including extensive new equipment for finishing and heat setting fabrics containing Arnel, Celanese's new triacetate fiber.

Work in the new laboratories is carried on by a staff of over 200 physicists, chemists, engineers, technicians and operators all with highly specialized training in fiber and textile technology. Dr. Reiner G. Stoll, director of Celanese applications and product development, pointed out in a talk at the opening ceremonies that the scientists and skilled technicians employed in the new laboratories have had practical experience in textile plant operation and are thus able to evaluate results of research in the light of commercial realities and market potential.

Celanese basic fiber research continues at the company's central research laboratories in Summit, N. J. Dr. Stoll said that when research at Summit reaches a stage where a new fiber appears to have commercial significance, findings are passed on to Charlotte for investigation of the fiber's commercial possibilities.

Mr. Blancke pointed out that the new development laboratories are a part of Celanese's recently reorganized marketing function. Once a new fiber has been developed out of research, he said, there is need for "responsible and intelligent guidance of the fiber through all of the various processing and distribution stages, into the finished textile products demanded by a value-conscious public."

"A recognition of this need prompted us at Celanese", he said, "to bring together facilities and manpower into a central organization, responsible to marketing to better assure that the results of our research would be properly handled by all of the various distribution levels between us as the basic fiber producers and the ultimate consumer."

Sales, Profits Are Higher

Mr. Blancke noted that Celanese sales for 1956 for all divisions of the company total about $185 million compared with $176 million for 1955. He added that profits for 1956 were better than in the year before. At present, about 70% of the company's sales are in textiles with the remainder being in plastics and chemicals.

Although Celanese at present produces only cellulosic fibers, the company does not limit itself to this type of textile material, he declared. Celanese may produce non-cellulosics if such a step seems warranted.

In addition to Mr. Blancke and Dr. Stoll, other speakers at the opening ceremonies were Kenneth C. Loughlin, executive vice president and John W. Brooks, general manager of the textile division. Other Celanese personnel who were present at the opening and acted as guides to the press in a tour of the new facilities were George Schneider, senior vice president; George Richards, senior vice president; Peter H. Conze, director of textile marketing; Dr. Bruce B. Allen, technical director of the textile division; Dr. H. J. Philipp, assistant director; Ralph H. Balch, manager of fiber and yarn processing Fred Fortess, manager of dyeing and finishing; and Joseph L. Barach, applications development. ■

An old and honored name in textiles, Ponemah Mills decided, several years ago, to learn new methods of fabric marketing in order to survive. An able young mill executive, Henry A. Truslow, was hired to lead the way. Here is a report on Ponemah's heartening progress

Henry A. Truslow

An old mill can learn new methods

By Jerome Campbell
EDITOR, MODERN TEXTILES MAGAZINE

DRIVEN by the whip sting of necessity one of the oldest tradition-encrusted giant New England Mills is striving to become a modern textile operation. Judged by its long history, its massive, high-walled brick mill buildings stretching for blocks along a swift running river, Ponemah Mills of Taftville in central Connecticut resembles many of the once-prosperous New England mills that have gone out of business in recent years. All the difficulties that caused other old New England mills to shut down have been experienced by Ponemah but with this difference: Ponemah management decided to stay in business, invest in new equipment and try new, more flexible, methods of doing business in order to survive.

Thanks to the combined efforts of willing mill workers and a vigorous new management headed by an energetic young mill executive, Henry A. Truslow, the attempt to revitalize Ponemah for survival in today's rigorous textile climate seems to be working out all right. Ponemah last year did better in earnings than it had for a long time. And before 1957 is over, Henry Truslow and his associates are confident that Ponemah will once more be a profitable operation.

Historically, Ponemah has always been a fine cloth mill. Its founders back during the second administration of President Grant took as their sphere of operation the fine cotton goods market, vowing to produce cotton fabrics as fine as any that came out of England. In time Ponemah's line of high count cambrics, percales, Victoria and Persian lawns, nainsook checks and stripes were recognized as outstanding on Worth Street and wherever fabrics were traded in the United States.

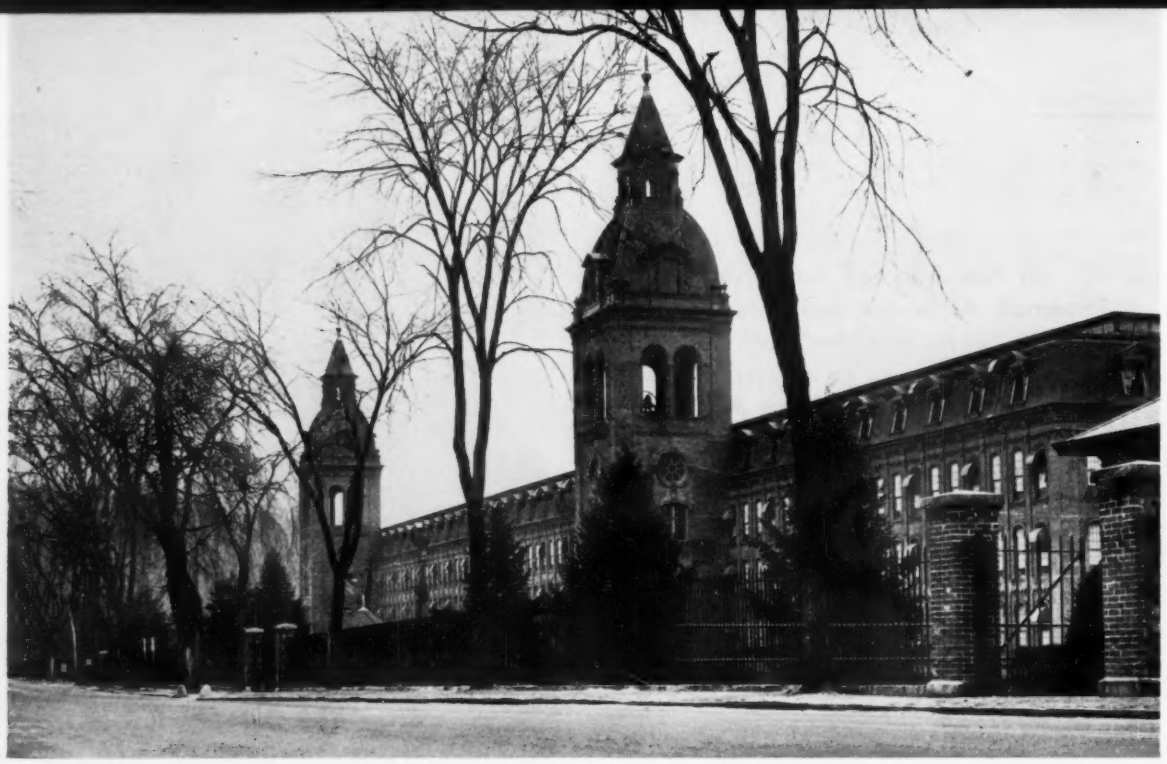
Incidentally, the mill derives its name from a line in Longfellow's Song of Hiawatha: "The islands of the blessed and the land of Ponemah". And for the benefit of those whose tongues have stumbled over this Indian name, the correct pronunciation is "Poneem-ah".

Ponemah was the first mill in the United States to import the silky long staple Egyptian cotton. Further proof of the mill's pre-eminence as a weaver of fine goods is found in the fact that many years ago Ponemah established itself as the largest producer of cotton typewriter ribbon fabrics—one of the most exacting types of cloth to make as indicated by the extremely high sley and pickage required, the fineness of the yarns and the need to weave them free of even the slightest defects.

From its beginning in 1871, Ponemah was a huge mill. The first structure, known as Mill No. 1 was 750 feet long, 75 feet deep and five stories high. Additional buildings were built in later years until in 1910, Ponemah reached its maximum physical size with the erection, adjacent to the original building, of an immensely broad one-story sawtooth roof structure to serve as an additional weave shed. This building is now the plant where Vicara zein fiber is manufactured by the Virginia-Carolina Chemical Corp. By 1924, the late afternoon of New England's textile glory, Ponemah had grown to be one of the largest cotton manufacturers in the United States. Its four mills clustered along the banks of the Shetucket were equipped with 4,000 looms and 265,000 spindles.

In the following years, Ponemah, moving with the times, passed into the production of synthetics until man-made fibers became as important in its operations as cotton. But with man-mades as with cotton, Ponemah's scheme of operation remained essentially unchanged. High quality goods were produced, mostly staples, lining twills of rayon joining the organdies, voiles and typewriter ribbon cloth of Ponemah's cotton goods line.

From 1940 on, output was sold through McCamp-



YES, THIS IS A TEXTILE MILL—Ponemah's main building, erected shortly after the Civil War, looks more like a fine Old New England college than a cloth manufacturing plant. The bell in the tower on the right is still tolled hourly at night to signal that all is well on the night shift.

bell & Co., old-established Worth Street commission agents. (Typewriter cloth was sold through American Bleached Goods Co. owned by the Frank A. Sayles estate). As was customary with older mill managements, relations between McCampbell and the mill, while cordial, were stiff and distant. The mill was not too interested in market trends, and the sales agent did his best to sell what the mill produced at the best obtainable prices. But the sales agent would have thought it presumptuous to advise the mill on what to weave, while mill people would have thought it out of place to ask the sales agent for anything more than superficial guidance.

The old ways of doing business became, in recent years, more and more difficult for Ponemah as for so many other old-fashioned mills in and out of New England. About four years ago, following several years of distinctly discouraging operations, the Sayles Estate, which also owns Ponemah, began a determined effort to check the mill's losses and get it back into a profit-earning position. Henry Truslow was hired to come to Taftville as plant manager.

The choice could not have been better. Truslow, a friendly, outgoing man with an easy, unassuming way about him, had earned a name for himself as one of the best of the younger generation of mill managers. Starting in 1935 at Pepperell's Biddeford, Me., plant, after spending ten months at Whitin Machine Works, young Truslow had worked his way up through the ranks to be assistant manager of the Pepperell's Fall River, Mass., mills.

At Ponemah, Truslow has headed a vigorous drive to bring the mill into a position where it can best utilize its splendid tradition as a producer of fine dress goods advantageously in today's highly competitive, changeable and exacting textile fabric market. Truslow's efforts to make Ponemah over into a modern mill have proceeded in three major directions, all of them difficult and all of them requiring great skill, tact and knowledge of textile manufacturing.

One of these directions has been the crucial need of bettering productivity and improving community and labor relations. Ponemah workers are organized into a local of the Textile Workers Union of America. For years, these workers, in the established New England manner, had taken care of their interests as they saw them through conventional union activities and negotiations. Management, for its part, although devoted to the community and proud of the textile skills of Ponemah workers had been, in the traditional New England way, somewhat stiff in manner and decidedly detached from the workers.

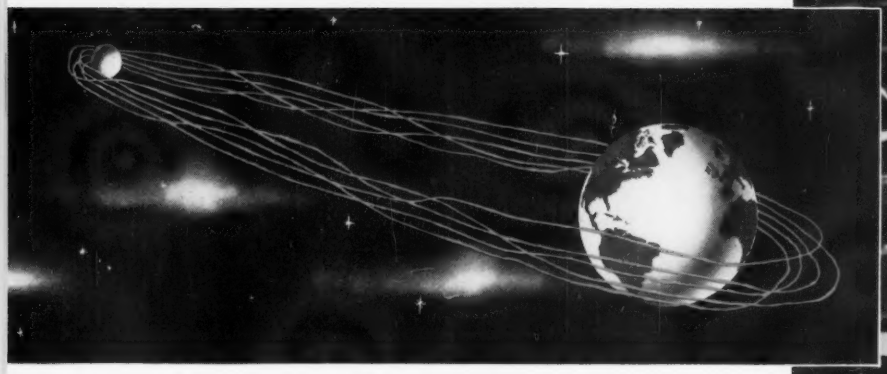
Truslow, when he became president and treasurer of Ponemah in November, 1954, after two years as mill manager, decided that the time was ripe for a new approach. He was convinced that productivity and labor relations would benefit if mill management and the mill workers drew closer together. It would be good, he thought, if management and workers learned to communicate more freely and warmly and became aware, of their real community of interests.

In February, 1955, with the cooperation of the union's local executive committee, he called a mass meeting of the mill's 1,000 or so workers, taking over a hall in nearby Norwich (there was none large enough in Taftville) and closing the mill for a half day. In a frank and friendly talk, he gave them the complete picture of Ponemah's situation, opening the books and quoting the hard figures that showed the mill was running at increasingly heavy losses every year. Thus it was made plain to the mill workers that unless Ponemah gave a better account of itself in the immediate future, their jobs might go the way of a lot of other jobs in New England textiles in recent years.

Once the painful truths of Ponemah's predicament was spelled out to them, the mill workers responded wonderfully. Work assignment changes and other improved operating efficiencies were tried out. A friend-

(Continued on Page 54)

10 billion yards to dye...



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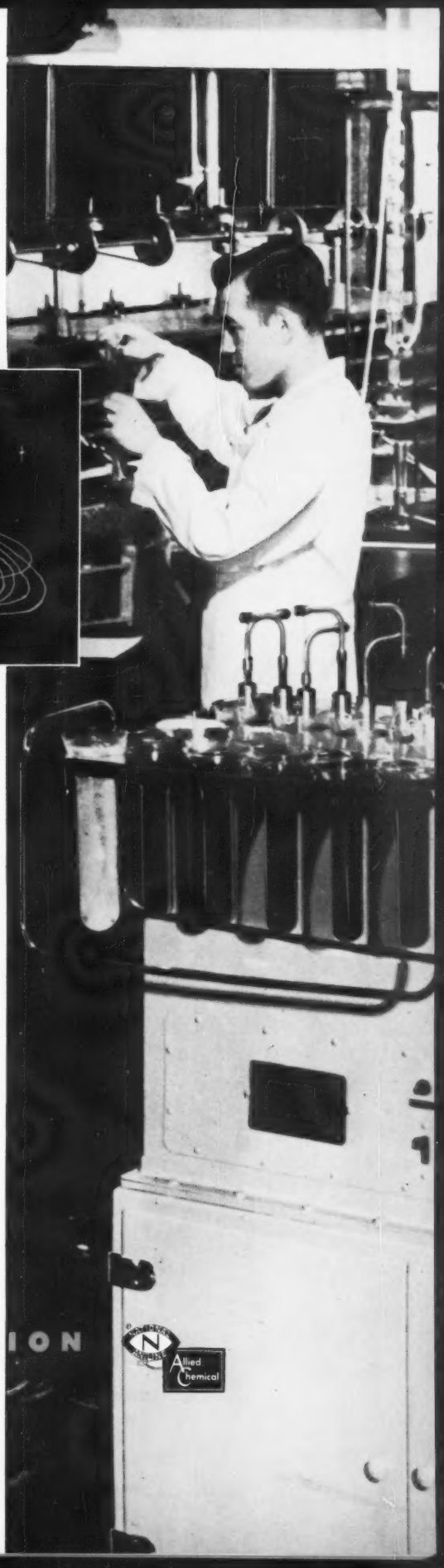

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Identifying synthetic fibers by

Micro-Fusion Methods

By Donald G. Grabar and Rita Haessly
CENTRAL LABORATORY, INDUSTRIAL RAYON CORP.

Summary

A scheme for the identification of synthetic fibers by the use of micro fusion methods is based upon the melting point of the fiber, the eutectic temperature of the fiber with p-nitrophenol as a reference compound, and the characteristic behavior observed during the heating and cooling of the fibers. Observations are made using a hot stage on a polarizing microscope. Reproducible melting points are obtained by using a silicone oil as a mounting liquid for the fibers to exclude air from the fibers while heating and to improve the microscopic image. Tabulated micro fusion data are given for thirteen synthetic fibers.

THE technical literature abounds in descriptions of various techniques for identification of textile fibers. These methods are based principally on microscopical observations of morphological characteristics visible in cross section and longitudinal views, together with supplementary tests such as staining, solubility, and refractive index (1,2,4). Although in favorable cases each of these techniques may afford positive identification in itself, in the majority of cases one or more of the tests must be used to confirm the results obtained by another.

The method described here, using micro fusion methods, is self-sufficient in most instances, but in some cases also must be confirmed by one or more of the other tests. However, it presents advantages over previously described techniques in being more widely applicable to both dyed and undyed, bright and dull, and filament and staple fibers. It is also generally faster and more positive in distinguishing between chemically similar fibers—e.g., Nylon type 6 and Nylon type 66. Although the fibers used in the test are destroyed, only very small samples are required.

Micro fusion methods have heretofore been applied only to monomeric systems. The general technique was originally developed by the Koflers in Germany (3), and extended and promoted in this country mainly through the efforts of McCrone (5) and coworkers. The identification of an unkown is based upon the use of a hot stage and microscope for determining (a) the melting point of the compound; (b) the eutectic melting point of the compound with a reference compound; (c) the refractive index of the melt; and (d) characteristic behavior observed during the heating and cooling of the compound. The determination of refractive index is unnecessary in the application of the technique described herein.

Melting points have been generally considered of limited use in fiber identification for two reasons: synthetic fibers which melt usually do so nonreproducibly over an appreciable temperature range, and many of the synthetic fibers decompose completely before their melting point is reached.

The first objection arises primarily from the common method of measuring fiber melting points, the copper block method. By this method a sticking temperature or softening point is observed, which, although useful in indicating use properties of the fiber —e.g., maximum ironing temperature—is of little analytical value. High polymeric fibers invariably are incompletely crystallized. When the fiber is heated, this incomplete crystallization causes a softening of the amorphous before actual melting of the crystalline parts occurs.

Furthermore, a range of crystalline perfection exists which extends the range over which true melting takes place. In addition, most fibers are susceptible to some degree of decomposition when heated in the presence of air, and this decomposition also contributes to the nonreproducible melting points obtained by the usual methods.

However, by use of a hot stage on a polarizing microscope, analytically useful melting points and much supplementary information can be obtained by actually observing the fibers as they are being heated. Although the true thermodynamic melting point may be different, the apparent beginning and ending of the melting of the crystalline portions of the fibers can be observed easily. The degree of decomposition caused by heating the fibers in the presence of air is minimized by using an inert silicone oil.

The second objection, that many fibers decompose below their melting points, is a valid one, but it can be circumvented. Just as with low molecular weight compounds in which such decomposition occurs, the melting points of many synthetic fibers can be depressed below their decomposition temperatures by the addition of a suitable second component. The eutectic melting point with this second component, as observed on a microscope hot stage, then becomes as useful for identification purposes as the melting point of the original fiber.

A suitable second component for use as a reference compound with synthetic fibers is p-nitrophenol. Those fibers which neither melt nor show eutectic melting with *p*-nitrophenol exhibit characteristic, reasonable, reproducible behavior patterns, which serve to distinguish them when they are heated and cooled on a microscope hot stage.

Steps in Applying the Method

Microscopic observations are made at 100 to 200 x using both ordinary transmitted light and polarized light. A first-order red compensator is used to determine the sign of elongation, and is also sometimes helpful in observing the disappearance of birefringence which marks the final melting of the fibers. A commercially available Kofler hot stage was used for the present work, but other carefully calibrated com-

(Continued on Page 44)

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Fiber Identification

(Continued from Page 41)

mercial or homemade hot stages would work as well. In such cases, however, temperatures different from those recorded in Table I might be obtained because of the characteristics of the hot stage used. Therefore, the preparation of a table matched to the hot stage in use is advisable.

Melting points of synthetic fibers are obtained much more accurately and precisely if the fibers are heated in the absence of air. This is done most conveniently by immersing the fibers in silicone oil while determining their melting points. This procedure has the added advantage of the improved image quality of a liquid mount over a dry mount. The silicone oil appears to be chemically inert with respect to the fibers (although a slight swelling occurs in some cases) and has a low enough volatility so that condensation in the hot stage is no problem. Dow Corning 710 fluid was used in the present work.

For the determination of the melting point and characteristic behavior of the fibers while they are being heated, a few filaments are placed on a half slide, covered with a drop of silicone oil and a cover glass, and placed in the hot stage. Usually lengths of 1 to 2 mm. are most convenient.

Before heating the stage, it is helpful to note by observing the Becke line whether the refractive index parallel to the fiber axis is greater or less than that of the silicone oil. Commercial fibers which have a refractive index parallel to the fiber axis greater than that of the oil are Dacron, Nylon type 66, Nylon type 6, Kuralon, Verel, Vicara, and saran. In this manner a preliminary grouping of the fibers can be made.

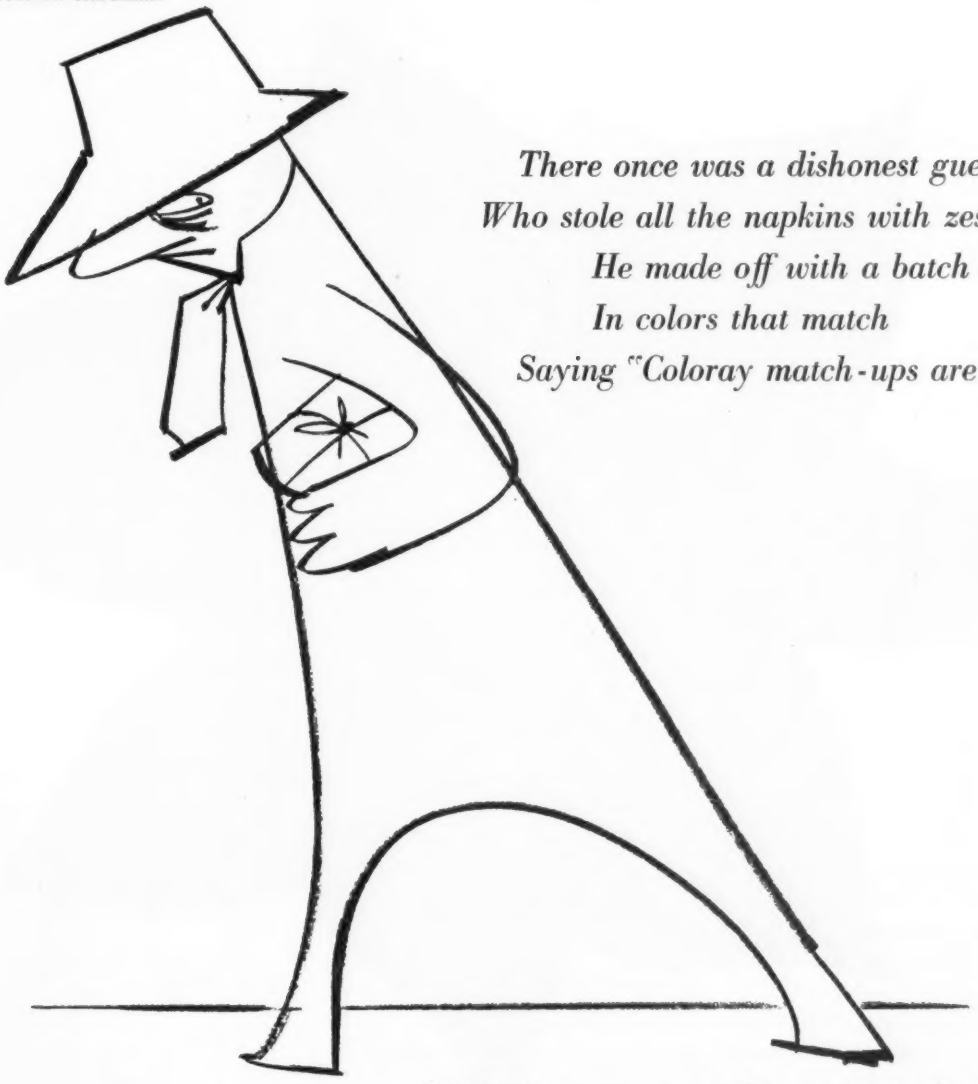
The stage is then heated at a temperature rise of about 3° C. per minute, and the following points of behavior and corresponding temperatures are observed: (a) abrupt longitudinal shrinkage; (b) discoloration (due to decomposition); (c) change in polarization color; (d) transverse swelling which usually precedes or marks (e) the beginning of melting, and (f) end of melting marked by the disappearance of the last traces of birefringence.

If sufficient sample is available, a supplementary observation can be made by placing a larger quantity between slide and cover glass without the silicone oil and heating on a hot plate. Observation will immediately show whether or not the fiber has melted. If the

(Continued on Page 48)

Table I. Micro Fusion Data for Synthetic Fibers

Fiber	Melting Point, °C.	Behavior When Heated Alone	Eutectic Melting Point, ° C.	Behavior When Heated with *p*-Nitrophenol
Arnel	297–300	Originally fiber is nearly isotropic but shows definite (+) birefringence by 60–70° C. Polarization colors fade from about 290° C., then fiber melts abruptly. Fibers discolor.	96–100	No significant change before melting.
Vicara	265–75	Polarization colors fade from about 240–50° C. and fiber begins to discolor. Isotropic at 260–5° C., melts at 265–75° C. and is dark brown from decomposition. Does not melt when heated in air.	....	Swells noticeably above 90° C. Swelling increases when *p*-nitrophenol melts but does not dissolve. Sign of elongation changes from (+) to isotropic at 103–8° C., and to (—) above 110–15° C.
Dacron	252–70	No significant change before melting.	109–12	Sharp and complete melting.
Nylon 66	251–64	Following first abrupt melting fibers go to uniform low order gray polarization colors until final melting.	71–5	Melting is sluggish, but complete before melting of *p*-nitrophenol.
Acetate	235–45	Shrinks and polarization colors fade at about 235°C. Becomes isotropic at 240–5° C.	88–92	Noticeable swelling over 80° C. Tends to retain form when melted.
Nylon 6	215–26	Same as Nylon 66.	69–73	Melting is sharp, and usually complete by 80–5° C.
Saran	170–6	Shrinks noticeably at about 160° C., and polarization colors change to low order gray (—) until melting occurs.	....	Only very slight shrinkage or swelling until about 140–50° C., then decomposes with evolution of gas and becomes deep red in color.
Dynel	....	Shrinks slowly over 135°C. Polarization colors fade from 175° C. Becomes isotropic at 190° C.	85–9	Fairly sharp melting, usually complete by about 95–100° C.
Orlon	....	Sign of elongation changes from (—) to isotropic at 165–80° C., then to (+) at 185–200° C. Reverts to (—) when cooled.	103–6	Noticeable swelling above 95–100° C. Melting accompanied by much shrinkage.
Acrilan	....	Same as Orlon.	106–9	Melting slow to begin but is rapid by 108–10° C.
Kuralon	....	Slight shrinkage at 215° C. At 220–5° C., abrupt shrinking, swelling, and most fibers go isotropic or show very low order gray polarization colors. Slight birefringence in few filaments persists as high as 290–300° C.	105–10	Abrupt shrinking at 105–10° C., but melting difficult to observe. Dissolves completely in melt of *p*-nitrophenol.
Verel	....	Negative sign of elongation. Polarization colors fade from 135–45° C. Isotropic by 160–70° C. No definite melting but fibers appear to fuse together at around 200° C.	92–5	No significant change before very sharp melting.
Darlan	....	Negative sign of elongation. At 180–90° C. shrinks abruptly, most fibers go isotropic, and swell. All fibers isotropic by 205–10° C.	104–7	No significant change before sharp melting.



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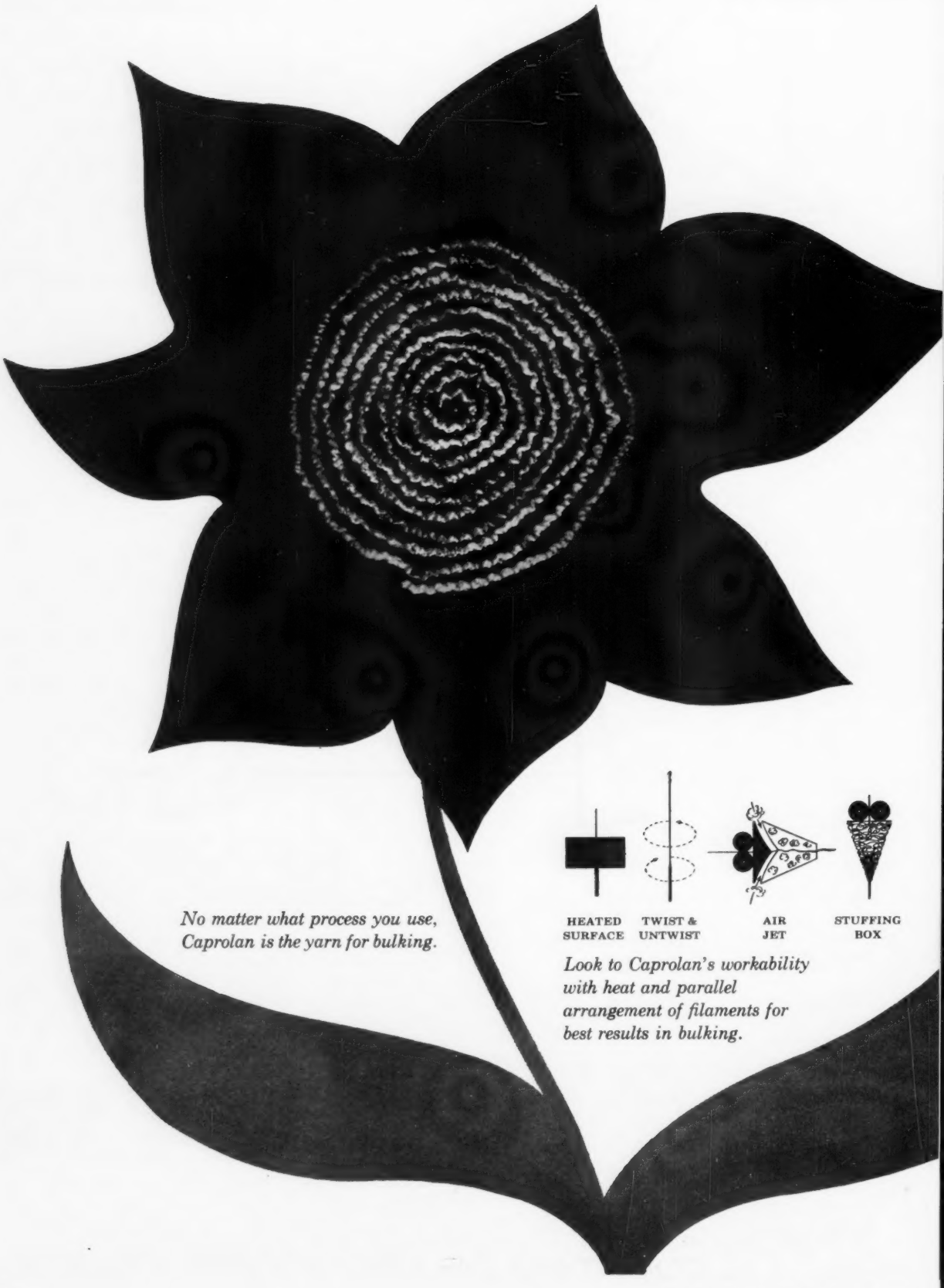

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Fiber Identification

(Continued from Page 44)

fiber melts, slight pressure on the cover glass will cause the melt to flow into a thin film between slide and cover glass.

If the slide is placed immediately on the cold microscope stage, observation will show whether the melt crystallizes upon cooling or whether it supercools to the glass state. For example, nylon characteristically crystallizes into a mass of spherulites, while Dacron supercools to an isotropic film which crystallizes only when reheated to about 100° C.

For the determination of the eutectic melting points and associated behavior, a few filaments 1 to 2 mm. long are placed on a half slide as before. Two or 3 mg. of *p*-nitrophenol (melting point, 113-14° C.) are then sprinkled over the fibers from the tip of a needle. The slide is tapped lightly to distribute the reagent and covered with a cover glass.

An alternate procedure is to place the short fiber lengths on the slide and cover them completely with a layer of *p*-nitrophenol and a cover glass. Then the cover glass is moved in small circles while applying a slight pressure with a pencil eraser or similar object. If the cover glass is then removed, and it and the slide are held on edge and tapped lightly on a table, most of the fibers and reagent will fall off.

When the cover glass is replaced on the slide, some areas will usually be found where a few filaments remain with a nearly optimum amount of reagent about them. The preparation shown in the photomicrographs of Figure 1 was made in this manner. The *p*-nitrophenol should be crushed prior to use to obtain a particle size of roughly 1 to 5 times the size of the filament diameter. Too much reagent and too large a particle size tend to obscure the beginning of melting.

The slide is placed in the hot stage and observed while being heated at a rate of about 3° C. per minute. The following points of behavior and corresponding temperatures are noted: (a) abrupt longitudinal shrinkage; (b) transverse swelling; (c) beginning of melting; and (d) complete or incomplete solubility of the fiber in the molten *p*-nitrophenol.

Results Obtained

The results of examination of all common synthetic fibers are tabulated in Table I. The temperatures given for melting points of the fibers themselves are the ranges from the first sign of melting to the disappearance of the last trace of birefringence. Each of these temperature limits is reproducible to within about ±2°C. Eutectic melting points are the temperatures at which definite melting is first detected. Because of the greater difficulty in observing eutectic melting, these temperatures are given as ranges of 3° to 4°C. The temperatures at which swelling and shrinkage take place are less reproducible than the melting temperatures, and all temperatures are dependent to some degree upon the heating rate, which must be carefully regulated.

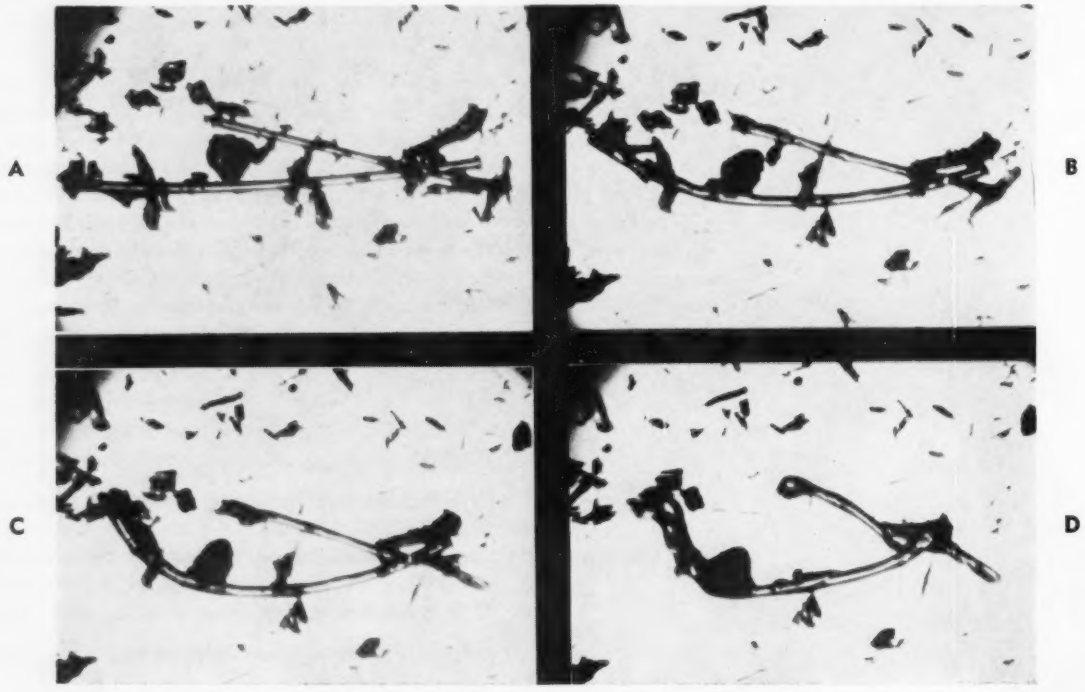

FIGURE 1—Eutectic melting of Nylon Type 6 with *p*-nitrophenol

A. 68.0°C.
B. 69.5°C.
C. 71.0°C.
D. 73.0°C.

Polyethylene is not included in the table because it is seldom encountered in fiber form except as large monofilaments. These and the bulk polymer, such as in molded articles, can be identified using this technique by their final melting point and the fact that, when melted with *p*-nitrophenol, they form immiscible melts. The common type of polyethylene melts at 110-14°C. Recently, however, higher molecular weight materials made by the Ziegler-type process have become available which may have melting points as high as 135°C. (Continued on Page 64)

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DYESTUFFS

New machines for pile fabric finishing

They are said to yield better results in crucial job of giving fur-like look to deep pile fabrics

STAFF PREPARED

THE growing production of fur-like pile fabrics, either knitted or woven of man-made fibers has centered attention in recent months on improved ways of finishing these fabrics. Specialists in their manufacture stress that correct finishing is crucial. How the fabric is finished, they say, often determines the difference between a mediocre and an outstanding cloth in terms of appearance and hand.

The need for improved finishing methods and better machinery for this purpose has led in recent months to the appearance of several new machines specifically designed for this field. One of these new machines is a pile napper specially designed for finishing pile fabrics of fur-like appearance introduced by Curtis & Marble Machine Co., Worcester, Mass.

According to Walter F. Woodward, vice president for sales, the new napper has proved itself successful after thorough testing on looped knitted fabrics such as those made by the leading manufacturers of fur-like pile fabrics.

The machine works equally well on synthetic blends and blends of wool and cotton mixed with synthetic fibers. According to Mr. Woodward, both low and high pile goods show a far more even surface on the finished fabrics as a result of the breaking and raising of a far greater proportion of the loops than has been possible up to this time.

On some fabrics, he points out, it was found that one run through the new napper produced better results than several runs through machines previously used for this purpose, thus cutting operating costs considerably.

The Curtis & Marble high pile napper is equipped with various types of rolls, such as friction, spreader and hold-back which, in proper combination, keep the goods under complete control as they are being napped by a large napping cylinder. Special quick-set adjustments, both vertical and horizontal, make it possible to nap at any desired depth. Settings for the napping process are made with a numbered dial, which permits identical napping results when the same fabric is run again.

The napper is encased in modern protective steel covers. Exhaust outlets are furnished so that they may be connected into a mill's present exhaust system.

Cylinder speed of the napper is adjustable between 300 and 375 RPM. Cloth speed, governed by a variable speed drive, runs at from 1½ to 7½ RPM. A total of 6 HP is used; 5 H.P. for the napper cylinder and 1 H.P. for the cloth feed.

Standard width for the machine is 72". Other width machines can be custom built. Floor space for the 72" machine is 8' 4" wide by 6' 8" deep. A clearance of 9' in height is required for the back arms.

Meanwhile, another new machine for finishing pile fabrics, the Electro-Finisher made by Turbo Machine Co., Lansdale, Pa. is being widely tested. In addition to use in finishing fur-like pile fabrics of Orlon-Dynel, the machine is said to be demonstrating good results on a wide variety of fleeced, napped and brushed fabrics.

According to Edward G. Hughes, Turbo sales engineer, the Electro-Finisher is being successfully used to give superior hand and appearance to fleece fabrics made of 70% alpaca and 30% wool. The Turbo-Finisher has also been successful in processing fabric with a wool face and cotton back. In this case the Turbo-Finisher was used first to raise the pile of the fabric. Following a light shearing, the fabric was again passed through the Turbo-Finisher. By reversing the direction of the machine's cylinder, the pile was laid down in a uniform way.

A wide variety of other pile fabrics, including 100% Dynel, 100% nylon and Arnel have been finished on the Turbo machine. In every case, the hand and appearance of the materials were altered in a way to make them more attractive and to result in purchase of the machine by the respective producers of the fabrics finished.

The availability of the Turbo-Finisher and the new Curtis and Marble napper raises the possibility, it has been suggested, for profitable commission finishing of pile fabrics which have a fur-like appearance. At present, many knitters and weavers might like to get into production of these fabrics, but hesitate because of their uncertainties as to correct finishing. A commission finisher equipped to handle fur-like pile fabrics competently might encourage the increased production of these goods and thus develop a profitable market for his services.

In addition to the Turbo-Finisher, Turbo Machine Co. has available two companion machines for finishing high pile fabrics. These are the Turbo Shearer

NEW MACHINE—Curtis & Marble are offering this new napper specially designed to handle deep pile fabrics

To the Queen's Taste

Queens, kings and all your customers, royal and otherwise, are demanding color fast fabrics nowadays.

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ALTHOUSE Dyes for Colorfastness
and
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Cottons, Rayons, Nylons and Blends

You are always sure of holding trumps, when you use these famous Althouse Dye Specialties:

Superlitefasts	**Nylanthrenes**
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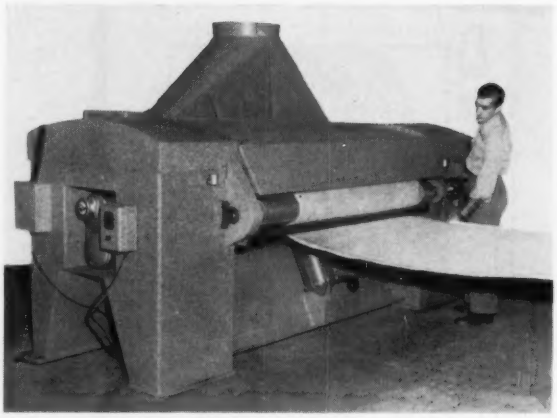
Whenever problems develop, Althouse researchers will help you find the winning combination of formulation and dyeing techniques to assure lasting color beauty. Althouse knowhow, based on more than 40 years of creative research, assures quality performance.

and the Turbo Wet Applicator. The machines are employed in the following finishing cycle:

When a high pile fabric is removed from the knitting machine or loom, it is given a preliminary and separate treatment to heat-set it so as to impart permanent dimensional stability. The fabric is then given its first shearing.

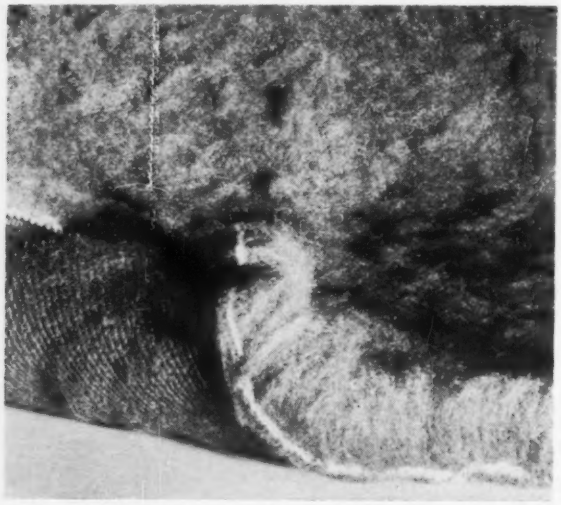
The next step in the Turbo finishing process is to pass the fabric through the Turbo Wet Applicator. This machine can apply any type of liquid to the pile of the fabric. It is equipped with adjustable brushes which can be positioned to control the exact amount of liquid required as well as depth of liquid penetration. Excess liquid is drained back into a pan and can be reused. The pan itself is easily removed for cleaning or for substitution of an entirely different solution. An automatic float valve, located on the side of the machine, maintains the proper liquid level in the pan. The machine can handle goods of any width up to 62 inches wide.

After the goods have been swabbed, if swabbing is done in order to get a high gloss, softer hand or other wanted characteristic, the next step is to pass them through the Electro-Finisher. The major element of this machine is an electrically heated cylinder which is controlled by instruments to maintain a constant pre-set temperature. The cylinder is faced with special groves which separate and straighten the pile fibers, add luster and give the fabric the desired "hand". A pneumatically controlled endless conveyor belt brings the cloth in contact with the cylinder at the speed and pressure desired. Speeds can be varied from two to 20 yards per minute.



FOR PILE FABRICS—Turbo Machine Co.'s Electro-Finisher is said to impart a wide range of desirable characteristics to pile fabrics

The goods being finished are passed through the Electro-Finisher two or more times depending upon the surface effect, appearance and hand desired on the fabric. After being put through the Finisher, the fabric is given a final shear. The Turbo Shearer used in this step in the finishing cycle is equipped for both rough and final shearing. It is equipped with a micrometer adjustment that varies the cut from 10/1000 of an inch to ½ inch. It is a rotary shear designed especially for finishing high pile fur-like fabrics. A control within easy reach of the operator sets the shearing depth by positioning the fabric conveyor. Blades can be resharpened quickly by reversing the main cylinder and running it against the bed knife. Shearings are removed by suction.



A TRIM NEEDED HERE—Pile fabric of Orlon-Dynel looks like this when it comes off the knitting machine before shearing and finishing

Dyeing Eastman's New 50 Yarn

THE recent announcement of the introduction of Eastman 50, the newest type of Estron acetate filament yarn to be offered the trade by Eastman, has naturally raised the question of how this new material should be dyed and finished. Eastman 50 has a modified cross-section quite different from that ordinarily associated with the acetate fiber known on the market for so many years. The two properties of Eastman 50 that will immediately become evident to the finisher are increased cover and a greater bulk both of which are more important to the finishing operation than to the dyeing.

Under ordinary circumstances, the dyer will note little difference in Eastman 50 and regular acetate. The slight difference in luster of Eastman 50 may cause the same formula to have a slightly different cast or hue, but little or no adjustment in amounts of dye should be required. Eastman 50 dyes at a slower rate than regular acetate, and the two fibers woven in the same fabric may appear to possess different depths. When one fiber is used as warp and the other as filling, little difference should be noted.

The methods of dyeing cellulose acetate are well known and it is unnecessary to describe these long-established procedures. No variations in standard practices are required in processing Eastman 50. The usual precautions observed with regular acetate should be followed.

The color fastness properties of any individual dispersed acetate dye is the same for Eastman 50 as for regular acetate. Dye selection should be determined by the requirements of the finished fabric. In finishing fabrics containing Eastman 50, allowances will have to be made for the increased bulk or fullness and the finish formula should be adjusted accordingly.

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Outstanding Quality

IN THE DRYING OF SCREEN PRINTED FABRICS

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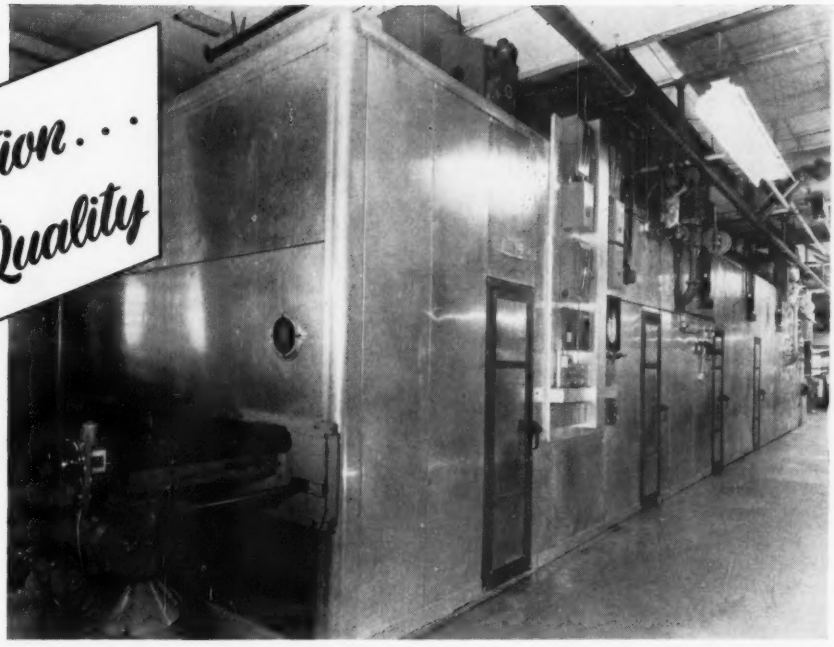

"NATIONAL" *Gas-Fired* TENTER

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As designed and installed by "NATIONAL", gas-firing means the ultimate in controlled uniformity of high temperatures; positive safety; and real savings in production costs. The "NATIONAL" system assures quick rise to any required temperature (no waiting for steam to come up); quick shut-down (at end of run or for any other reason); and an absolute minimum of maintenance.

"NATIONAL" Gas-Firing—*Factory Mutual approved*—can be installed as a complete heating system, or as a "booster" unit, in either new or existing drying equipment.

Loop, Tenter, Roll, and other Textile Dryers can now be gas-fired with equipment especially designed for this purpose, and installed by men who *know the best gas-fired arrangement* for the particular dryer involved.

"NATIONAL" Gas-Firing Systems are demonstrating their outstanding superiority over other types because they are designed by drying engineers to get the best possible results when applied to drying equipment. Why not talk it over with a "NATIONAL" representative, now?

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Ponemah

(Continued from Page 38)

lier and more harmonious relationship grew up between workers and management people. The mill became a happier place to work in and the small town of Taftville a happier place to live in.

Truslow has made it a vital part of his duties to work hard to bring Ponemah management closely integrated into local affairs. He is one of the leaders in the community fund drives; he takes an interest in other charitable activities in Taftville and nearby Norwich; he is actively interested in the fire department and the local American Legion. His two younger children, Nancy and Barbara, attend Taftville's small public school.

These efforts are bearing fruit. Workers and management are friendlier. The workers are coming to see the mill as an important element in their lives. Recently, when the local Roman Catholic Church burned down, the predominantly French Canadian and Catholic population of Taftville was grateful when the mill management turned over to their pastor, Father Laurion, an entire floor in one of the mill buildings to serve as a church until a new church is built.

Further evidence of the closer relationship between workers and management brought about by Truslow's efforts is a flourishing credit union in the mill. Started in 1955, the credit union, helped and encouraged by management, has caught on wonderfully with the workers who are proud of its success and its growing financial strength.

Water Power is Converted to Electricity

The second path which Ponemah has taken toward more profitable operation has been in the direction of modernization of its equipment. Fortunately, Ponemah management had never got too far behind in modern equipment so that the mill, although it could stand improvement, was by no means burdened with generally obsolete machinery. Within the past ten years for example, the power generating system, which uses water power from the Shetucket River, was completely modernized at great cost. Two modern turbine generators were installed in a major reconstruction which abolished the former old-fashioned water wheels. An elaborate system of evaporative cooling installed by American Moistening Co., provided the atmospheric conditions that is so necessary for efficient spinning and weaving in modern mills.

Since Truslow became president, spinning frames have been reconditioned for modern long draft spinning and equipped with new spindles. New frames have been bought and installed including a trial installation of Saco-Lowell's Gwaltney frames. Cards have been rebuilt and new 14 inch sliver cans installed to replace the former ten inch cans. The bigger cans, by reducing the piecing of sliver ends, reduce cost and improve sliver quality.

N. T. F. Naylor is Ponemah's assistant treasurer and controller

W. W. Kellner is controller of production at Ponemah

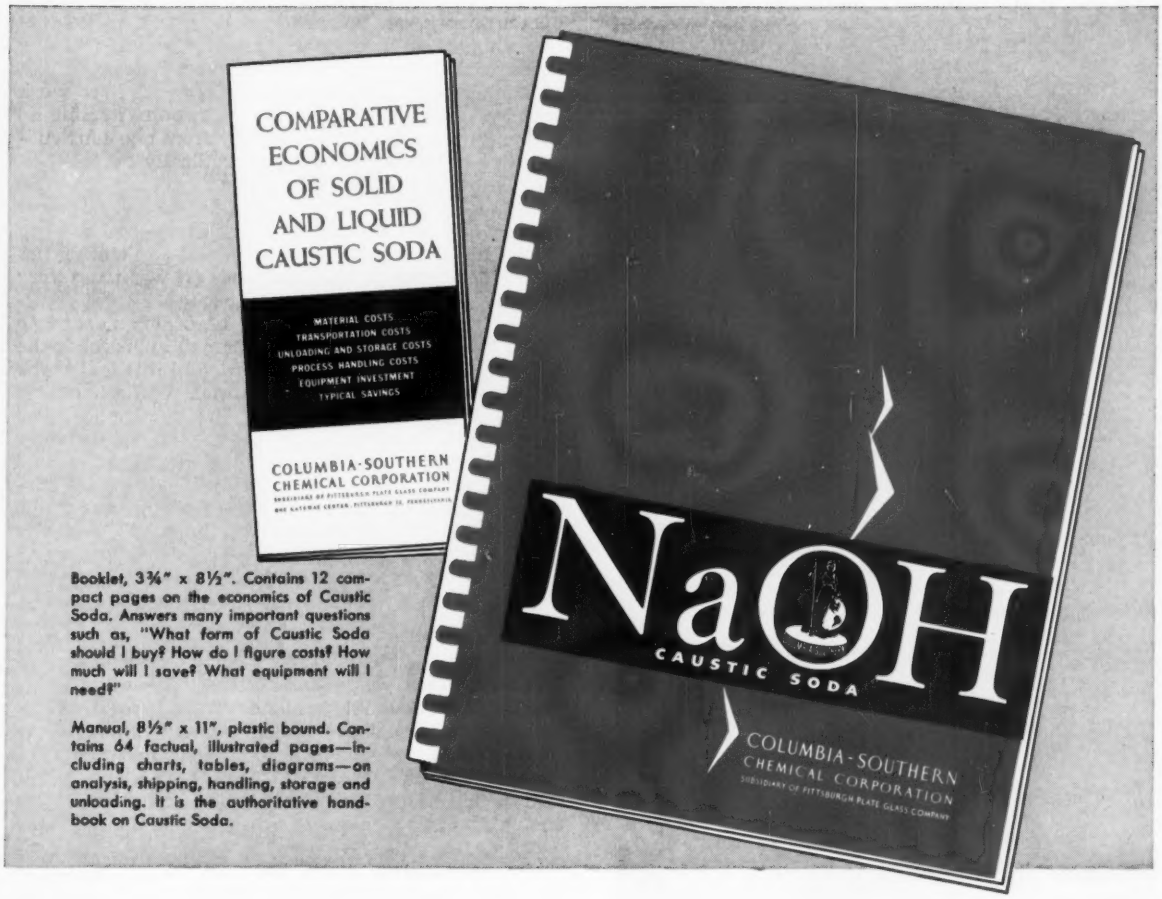
In the weaving department, Ponemah made textile history last year when it was the first to place a substantial order for the new Unifil machine developed by Universal Winding Co. Unifil is a device which winds filling bobbins right on the loom thus making unnecessary the conventional filling winding operation as a separate function. (For a detailed report on this machine see MTM, Nov., 1956, page 35.) Ponemah's order for 526 Unifils is an impressive indication of the mill's determination to modernize, and the willingness of its owners to invest new capital.

Box Looms Recently Acquired

To augment its many hundreds of Draper plain goods looms, and be in a position to weave a greater variety of fancy goods, Ponemah recently acquired 110 Crompton & Knowles 4 x 1 box looms. Meanwhile, in the vast weave room of Ponemah's No. 2 mill, the installation of overhead traveling cleaners is going forward. These cleaners, moving on trolleys hung from the ceiling, blow a jet of air down on the looms, forcing the lint to the floor where it is quickly and easily swept up.

The third important step which Ponemah is taking toward adaptation for survival in the modern textile world is to make marketing as important as manufacturing. As worked out by C. Thurston Woodford, McCampbell vice president in charge of its uptown office, and James Lucier, sales manager for synthetics at McCampbell along with Laurence B. Rand, sales manager for cottons, the new marketing approach is based on a policy which restricts drastically weaving for stock and concentrates on production against orders actually received.

For a mill equipped with 2,600 looms and 76,000 spindles, this new approach requires alertness and open-mindedness in the men in charge. They have to be able to produce the kind of specialty cloths that buyers in the New York market like.



Booklet, 3¾" x 8½". Contains 12 compact pages on the economics of Caustic Soda. Answers many important questions such as, "What form of Caustic Soda should I buy? How do I figure costs? How much will I save? What equipment will I need?"

Manual, 8½" x 11", plastic bound. Contains 64 factual, illustrated pages—including charts, tables, diagrams—on analysis, shipping, handling, storage and unloading. It is the authoritative handbook on Caustic Soda.

Do you have these two valuable books on caustic soda?

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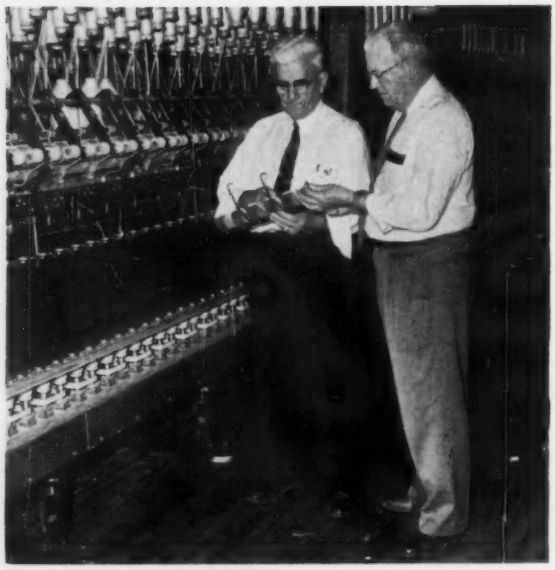
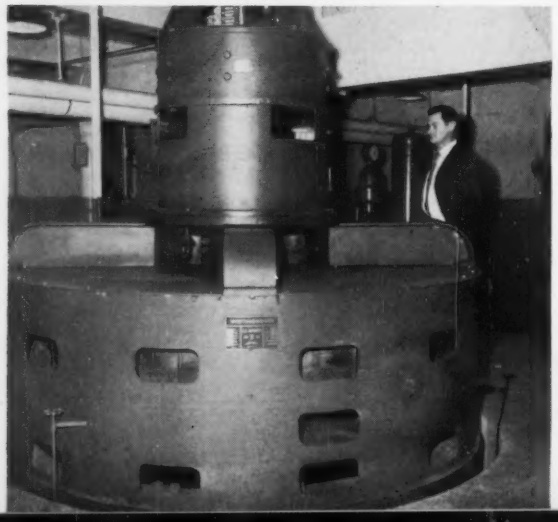


THE SCRUTINY OF EXPERIENCE—Albert Maino (left) overseer of spinning, and Carleton Grinnell, superintendent of Ponemah's No. 1 division, study the working of the mill's Gwaltney spinning frames

NEW IDEAS BRING NEW EQUIPMENT—Michael J. Grimes, (right), superintendent of No. 2 Division, and loom fixer, Ernest Coutu, study the operation of one of the 526 Unifils Ponemah has bought from Universal Winding Co. Overhead is one of the Parks-Cramer traveling blowers installed as part of Ponemah's modernization program



POWER FROM WATER—D. E. Congdon, plant engineer and personnel director, admires one of the two modern turbines and generators under his charge. Water from the Shetucket River operates the turbines which were installed a few years ago

The new approach means stepped-up fabric development work, an unceasing program of trying out new things in the way of fabric styles and showing them to customers and prospective customers.

The new approach also means doing the hard work necessary to keep production operations flexible so that output can be shifted quickly from one construction to another cloth sometimes radically different. It also means flexibility in the sense that many different types of cloth can be produced in the same weave room where in the past it was the custom to keep thousands of looms steadily on one or two cloth types month after month and sometimes (it was true) year after year.

To obtain the constant flow of orders needed to make the new policy work, Ponemah approaches the market with its best foot forward, and this foot is the mill's long established, substantial reputation as a producer of fine goods. Under the new policy, Ponemah seeks a relatively small number of carefully selected customers who want high quality goods and are willing to pay the necessary price. To these customers who want the best for the womenswear trade, Ponemah offers on an exclusive basis, a constantly changing, interesting and provocative variety of samples of highly styled fabrics. When orders are received the goods are woven quickly and sent off to be finished.

Flexibility and Variety are Watchwords

The new policy applies to all-cotton goods, to synthetics, and above all, to blends. To be modern at Ponemah means that the mill is strongly interested in the ease-of-care trend in womenswear. Ponemah consequently turns out a lot of Dacron-cotton and Orlon-cotton fine blouse and dress fabrics for use in garments meant to be easily washed and then quickly worn again.

As an illustration of how the new policy has changed Ponemah, Truslow points to the state of things today in the No. 2 mill weave room as compared with a year ago.

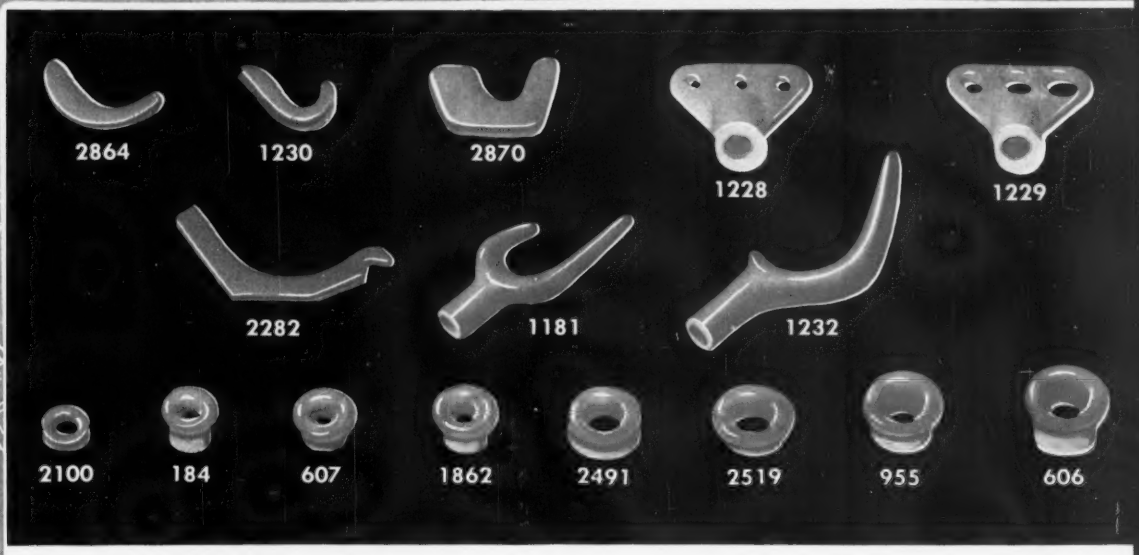
"A year ago," he says, "there were 1,500 looms in this mill running filament rayon and acetate cloth—such old and unexciting standbys as lining twills, acetate taffetas, acetate satins, rayon seat cover cloth and the like.

"Today at Ponemah there are hardly any looms weaving filament cloths—we decided that in these staples we could not compete at current prices. Today in our No. 2 weave room, we are producing a variety of fabrics that would have surprised and perhaps frightened us a few years back.

"Among the constructions you'll find all running simultaneously are dress fabrics with cotton warps and Bemberg Cupioni filling; 96 x 96 Dacron-cotton dress batistes; fine dress goods made with a combination of filament Dacron and Dacron-cotton spun yarns; Dacron and linen blended fabrics. That's only a few; there are many others."

So far, Ponemah's new policy of functioning as a style mill is working out well. This year, Henry Truslow and his associates expect to enjoy the pleasant sensation of reading reports from the accounting office showing for the first time in years, that their mill is earning money. And they are confident that as they grow more and more experienced in steering their new course, in the swirling currents of the fashion industry, that Ponemah will become an habitual earner of profits. ■

MACHINERY and EQUIPMENT SECTION



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Recent loom improvements

By W. C. Howe
CROMPTON & KNOWLES CORP.

A spokesman for Crompton & Knowles describes recent work by his company leading to better weaving

WITH the firm conviction that the textile industry will continue its important position in our domestic economy, Crompton & Knowles Corp. will place emphasis during the months ahead on new developments requiring engineering, pattern, and tooling expense running into hundreds of thousands of dollars.

In line with Crompton & Knowles' policy of serving an entire cross section of the weaving industry, neither its long-range research nor its immediate engineering effort is confined to a specific field. The result is a wide range of programs in various stages of completion, each channeling into its own or interrelated fields to maintain the gradual improvement in weaving machinery, which has the most beneficial, while at the same time the least upsetting, effect on textile economics.

As an illustration of interrelationship, the development of push-button controls for starting and stopping the loom and for jogging the lay forward or backward, together with electronic magnetic protection to improve performance and eliminate shock to the loom, as well as electric brake and clutch motions and independent motor driven head reversing mechanisms, could only be developed at the beginning for looms running as high as $50,000 each in value. This was so because of the then high cost of the electrical and electronic features involved.

The operating value of such devices was first established on specialty looms such as the Type F-2 Woolen Papermarkers' Felt Loom, which is presently built up to and including 650" in between swords width and which runs at 28 picks per minute, and the "Speedi-Weave" Loom for multishuttle narrow fabric production at speeds up to 250 picks per minute. The usefulness of these devices having been proven, the problem then was to lower costs to the extent that the features could be adopted to standard fly-shot looms.

Much progress has been made, and combinations of electric protection, electric brake and clutch, lay reversing, and push-button controls have been simplified to the extent that costs are reduced from thousands of dollars per loom, as in the case of the F-2 Loom, to figures that will justify their use on looms for the cotton, rayon, and woolen or worsted industry.

That the problem of cost reduction has been solved is due to engineering know-how which has permitted alteration in controls to handle motor equipment up to 6 h.p. capacity with the electrical units operating on a watt rather than kilowatt basis, as was initially the case.

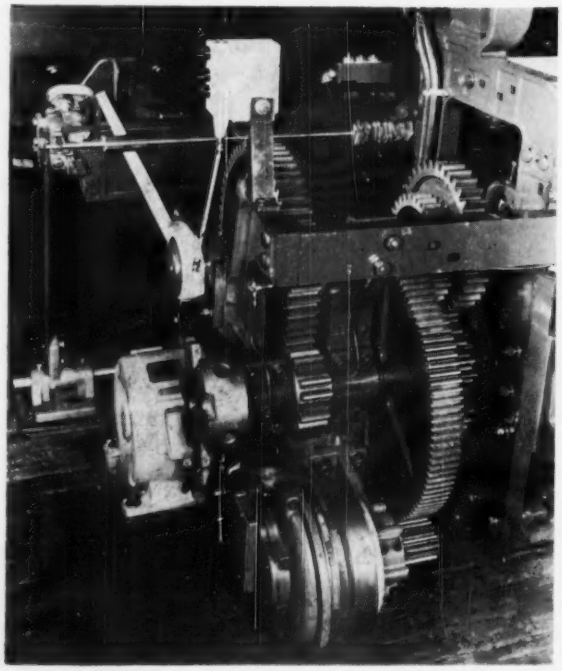
Field tests on such equipment have already confirmed the desirability of these new features which will be made available on a gradual basis as production tooling is completed.

Such features as we have mentioned will contribute to the effectiveness of the weaver and improved loom performance at higher speeds, as well as lowered maintenance. In addition, the reduction in physical effort involved in running the loom should in some cases permit better work assignments or the employment of a type of labor where physical strength is not at a premium.

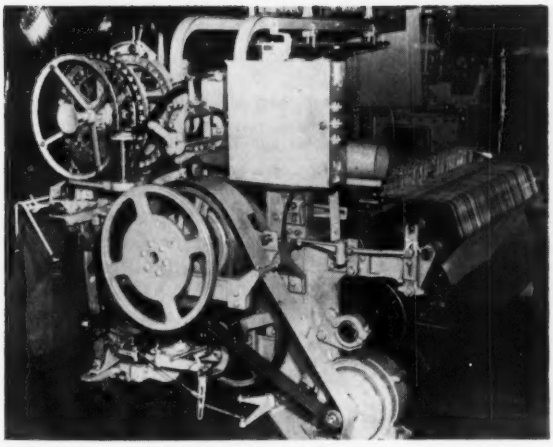
At the same time, Crompton & Knowles has not neglected the quality aspect of cloth production. An outstanding example in this direction has been the development of the M-P Loom which is the first completely automatic bobbin changing loom capable of weaving, on an economic basis, fancy filament fabrics where several colors or classes of filling are involved. This was made possible through the development of the rotary magazine for four colors of (not merely single colored) filling.

Coupled with better control of bobbins and filling at transfer incident to this rotary magazine, are the vacuum filling control feature and the scissors thread cutter which cuts filling at the shuttle eye to further improve threading and help eliminate the bugaboo of drag-ins.

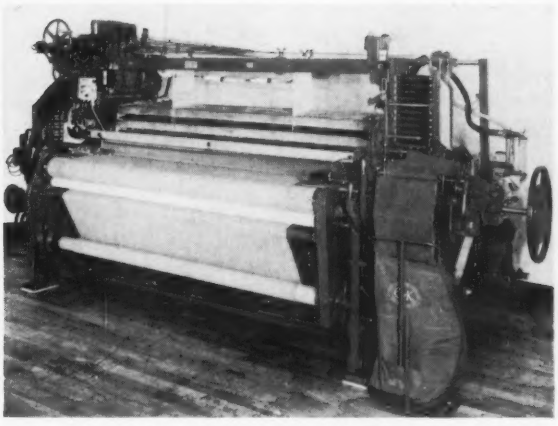
Terry motions for wide Type C (cotton) and Type W (woolen or worsted) looms are available or will be



Electric brake and clutch with loom V-belt drives. Two 3 h.p. synchronized motors at opposite ends of each Type F-2 Loom



End view of M-P Loom showing electric brake and clutch, V-belt drive, electric control panel, vacuum filling control and multi-color rotary magazine



W-3 (Pick and Pick Automatic) Loom, 82" between swords, equipped with 25 harnesses, 4 x 3 box weaving automatically with shuttle sequence

A 1
B 2
C 1

available shortly for widths up to 120" between swords for the economical production of many specialty fabrics.

Producers of mechanical fabrics, carpets, etc., have kept an entire section of the Crompton & Knowles engineering department busy for several years. The result has been the development of wider, stronger, and more versatile looms including the Type D Loom used by the cotton dryer felt producers. Modern Type B Axminster Carpet Looms are being equipped with electrical controls and also stop motions with semaphore systems to indicate to the operator which of the many interrelated mechanisms on the loom has occasioned a stop.

BEING mindful of the increasing need of versatility without the usual sacrifice of economies in operation as related to production and work assignments, Crompton & Knowles is now announcing to the trade a new *P*ick *A*nd *P*ick *A*utomatic Loom (nicknamed the PAPA Loom).

The PAPA Loom is fully expected to be the big development of the year to the outerwear trade as well as for upholsteries and even in the production of foundation garments, swim suits, and other fabrics involving the use of covered rubber filling alternating on a single pick basis with some other filling.

Some of the operating advantages and mechanical features which will make C&K's new PAPA 4 x 3 box loom a major step forward in the weaving of men's and women's wear in all wool, worsted or blends as well as upholstery and many other specialty fabrics are as follows:

1. Elimination of "dead picks" or lost time for replenishing filling means increased production.
2. A very much wider range of box pattern possibilities due to the presence of a 3-cell shuttle box at the drive end.
3. In addition to a very wide range of fancies which may be woven on a pick and pick automatic bobbin changing basis, better blending is possible since either four or five shuttles may be used, these picking in a fixed sequence of:

   4-Shuttle—1 2 3 4, 1 2 3 4, etc. or
   5-Shuttle—1 2 3 4 5, 1 2 3 4 5, etc.

4. Smaller bunches on bobbins (less filling waste than on the popular "Select-A-Pic" Loom), and on some patterns normal bunches may be used.
5. Drastic reduction or virtual elimination of drag-ins.
6. Without major loom conversion the PAPA Loom, in addition to automatic pick and pick fabrics, may be run automatically on regular 4 x 1 box and 4 x 2 box patterns and nonautomatically with the feelers stopping the loom before the filling runs out on those 4 x 3 box jobs that cannot be woven automatically.

All of the foregoing add up to lower operating cost due to increased loom output, increased output per operator, and decreased seconds on this most versatile of looms.

Mechanical Features

Mechanical features contributing to the fine performance and economies of operation of the PAPA Loom include:

1. 4 x 3 box automatic bobbin changing with a split box at the drive end permitting two shuttles to be "dwelled" in the lower cells while a transfer is made on a third shuttle in the top cell.
2. Feelers are a bank of four at the head end. This permits using two or more different types of feelers at the same time if desirable; that is, light or regular touch electromechanical on metallic yarns, and all-electric if required for nonmetallic, filament, or fine yarns, etc. Yarns such as woolens or worsteds and most blends would work equally well with either type of feeler. Feelers being on the head end are in a better position for nonautomatic operation if ever necessary, as exhausted shuttle will stop at the drive end where the filling is usually stored. Better indication occurs since no critical timing problems exist.
3. *Inertia Transfers:* Simultaneously, moving box and transfer hammer create a condition contributing to positive transfer and fewer bad doffs.
4. *Plunger Type Stop Motion for Top Shuttle Box at Drive End:* This device stops the loom if shuttle is not in proper position for a transfer. Also, the device will stop the loom during normal operation if shuttle in top cell is not properly boxed.
5. *Scissors Thread Cutter:* A Scissors Thread Cutter made as an integral part of the "rising" box cuts the filling at the eye of the shuttle, eliminating the long tail on the outgoing bobbin and helping to reduce drag-ins.
6. *Swisher Motion:* At time of transfer a "swisher"

motion or placer arm mounted on the inside magazine frame contacts the filling between the Scissors Thread Cutter and the selvage, withdrawing the cut filling from the shuttle box and presenting it to the vacuum operated suction tube where it is held at an angle which insures early cutting by the new scissors type temple cutter. Following this, the cut end is free to be retracted through the suction tube to waste filling receiver at outer end of loom.

7. *Filling Placer and Thread Hook:* Two sets of filling placers and thread hooks, one on either side of the magazine, push and place the filling on the new (ingoing) bobbin in such a position as to facilitate early temple cutting. Following this, the combination of vacuum and jet control system withdraws yarn from the danger (drag-ins) area and makes possible easy withdrawal of end into waste filling receiver at outer end of loom.

8. *Vacuum and Jet System:* A double-acting pump is mounted on the loomside and actuated by a connection to the reciprocating lay to provide the vacuum as well as the air jet. This system accomplishes the following:

a. The vacuum system holds taut the tails from the bobbins stored in the magazine to the filling end holder. The vacuum also sucks the filling through the holder into the receiver after the bobbin is transferred and the yarn is cut at the temple.

b. Jet of air under the filling between the holder and the magazine keeps the stored filling from contact with the moving lay parts. The jet also helps retract the filling on the ingoing bobbin after the temple cuts it at the selvage and assists the vacuum control in disposing of the waste end.

c. A second vacuum operated suction tube extends to a point opposite the "swisher" on the inside magazine frame and holds the filling when cut by the Scissors Thread Cutter at the eye of the shuttle, at an angle which insures early cutting by the temple, after which the vacuum withdraws the cut filling into the waste filling receiver.

Temple

A revolutionary new temple cutter construction made possible by the combination of vacuum and jet filling control systems permits locating the temple almost in contact with the reed, thus holding the cloth better and permitting early cutting. The cutter employs a scissors arrangement with positive control (no straps or springs) and will permit a shuttle to dwell at that end of the loom for any required number of picks without cutting the filling until required to do so after transfer.

Bobbin Ejection

Bobbins are thrown forward between the upper and the lower box at transfer by a moving deflector, and a closed chute funnels the empty bobbins into a light, easily removable bobbin bag which is definitely located by a floor plate. The bag holder is adjustable for height, and the bag will hold about 200 empty bobbins without interfering with transfer or causing a drag-in. No bobbins on floor.

Indication

Indication from both transferring and box mechanisms is simple and eliminates critical timing problems. All box pattern indication is separate from harness pattern indication so long harness chains are not required for synchronization.

Jacquard Operation

Since no dead picks are involved, no problems are created when the loom is to be run under a jacquard.

To explain further the capabilities of this new and worthwhile development, a brochure has been prepared which provides instructions, details of operation, interrelationship of motions, and in addition, box chain and harness chain drafts of many pick and pick fabrics which would normally require a 4 x 4 box nonautomatic loom to weave.

Outlook

(Continued from Page 34)

Emphasis on Quality is Encouraging—Another heartening development for man-made fiber fabrics is the extension of efforts by fiber producers to encourage quality maintenance and styling. These efforts are developing in the direction of quality identification. The chemists and scientists, who are shocked at the extent to which consumers will buy poor quality merchandise, must recognize the fact that consumers have no trustworthy means by which they can identify good quality. They may depend on the store, or on a nationally known manufacturer's name. But these are not always trustworthy aids, and the vast majority of merchandise is completely anonymous, so far as quality is concerned.

Labeling, however, also presents its problems. Merely identifying the composition of a blend still leaves the whole area of fabric construction and finishing in which cheapening of the worst sort may take place. In fact, if blend composition labeling succeeds in stimulating sales, it may invite cheapening of the fabric not in blend composition but in construction or finishing.

Other problems encountered in labeling involve the testing necessary to make a label meaningful, and the fact that the value of any one label decreases as the number of labels grows.

Wide-Scale Promotion Would Help—Anything short of an industry-supported quality labeling program assuring satisfaction to the consumer without regard to fiber content, runs the risk of causing confusion and inviting abuse. And even an overall quality identification would have to be supported for a considerable period of time by a susbstantial advertising and educational budget before the consumer would recognize or understand its value, increase the purchase of labeled goods at the expense of unlabeled goods, and thus create demand which would be reflected through the retailer to the cutter, converter and mill.

Nevertheless, such a situation is the only condition under which the industry can compete more successfully with producers of other types of consumers' goods, and would be largely relieved of the "policing" problem which is so troublesome when a single organization attempts to establish its own quality standards.

Hunter now heads machinery group

W. Frank Lowell

James H. Hunter

JAMES H. Hunter, president of James Hunter Machine Co., North Adams, Mass., is the new president of the American Textile Machinery Association. He was elected at a recent meeting in Boston, Mass., to succeed W. Frank Lowell, senior vice president of Saco-Lowell Shops who served for the past two years. William K. Child, vice president, Draper Corp., Hopedale, Mass., was elected vice president of the association. Approximately 90% of the textile machinery manufacturers in the United States are members of the association.

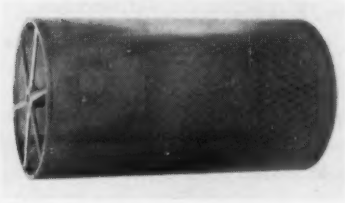
Mr. Lowell, in his final report to the membership as president, said that textile machine builders face the coming year with cautious optimism. He expressed the opinion that planned modernization programs by textile mills are the only means by which these fabric producers can meet the challenge of domestic and foreign competition. Realization of this fact by textile mill executives, he stressed, would be the measure of the future business of textile machine builders.

Mr. Lowell pointed out that American textile machinery manufacturers conduct research and development programs that result in lower production costs for textile mills through machine improvement, greater efficiency and improved labor saving devices. These developments are alerting mill executives to the opportunities provided by basing capital expenditures upon "reduction in manufacturing cost and upgrading of quality through modernization" instead of the old base of "return on investment".

In reviewing activities of the association over the past year he emphasized the general services of the organization to its membership. He said ATMA proceeds in a conservative manner in all planning, but has been recognized for industrial leadership and interest in textile education when the Board of Trustees of Lowell Technological Institute set up a scholarship named in honor of ATMA .

In a brief talk, Mr. Hunter pledged his efforts on behalf of the group in the coming period which he hoped would be one of "peaceful prosperity." He stated that for the next year "we hope to be able to continue the constructive program and progress of the American Textile Machinery Association" and he expressed the wish that the association would receive the assistance and advice of each member regardless of its size.

Mr. Hunter has long been active in the affairs of the association having served as a director for several terms and for the past two years as vice president. He was also a member of the committee in charge of planning and directing of the 1954 American Textile Machinery Exhibition.

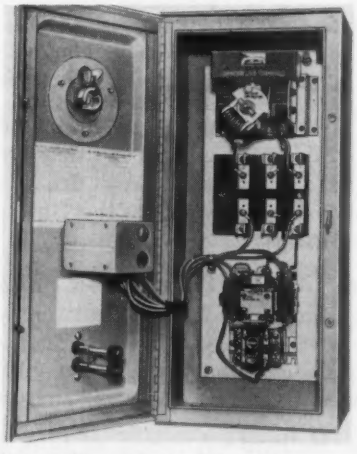


Enamel Finished Screens

Jenkins Metal Shops, Inc., now offers a baked enamel finish on screens for the textile industry, including picker, condenser, waste machine and filter screens. Although perforated metal has been used in making these types of screens for some time, it has only recently been tested and approved for use on cottons to any great extent. *For further information write the editors.*

New Card Controller

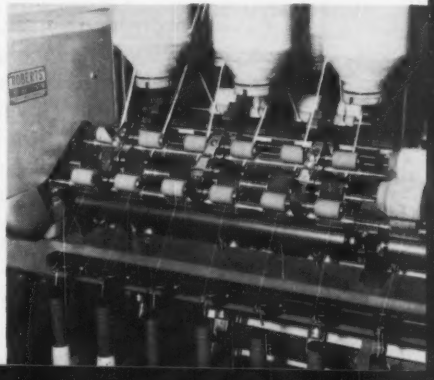
Cutler-Hammer, Inc., offers a new controller specifically designed for the regulation of individually-driven cotton cards. The individual drive system eliminates line shafting, belts and oil-drip. The controller, available in NEMA sizes 0 to 1, also offers lower horsepower consumption and reduced maintenance.



Top Roll Suspension System

A top roll suspension system using double-row ball bearings in the front, middle and back lines has been introduced by Roberts Co. The suspension system is claimed to have the following features, many of them not found in other arrangements: cots buffed on standard equipment; cots revolve together making lap removal simpler.

Full length revolving cleaners are used; interchangeable front and back rolls; controlled self-alignment. Also a two-piece labryinth seal is protected from lint and roll picker damage. Bearings are grease-packed for life, and either conventional dead-weighting or new spring weighting can be used. *For further information write the editors.*



REPORT FROM EUROPE

BY SPECIAL CORRESPONDENT

New Italian fiber to be "lowest priced"; Gasoline shortage cuts tire cord demand

PARIS—Italy is about to start production of world's lowest priced synthetic fiber—to be used along with hemp and jute. The firm: Montecatini, Italy's biggest chemical works. The product: a polypropylene fiber. A Ferrara pilot plant has been expanded to turn out 20 metric tons a day of fiber, the fabric to be woven in Terni.

Professor Giulio Natta, Montecatini technician who revealed new fiber recently, said Company would commence commercial production of the polypropylene for textiles and plastics late in April. He said fiber's strength would compare favorably with nylon; that it could eventually be produced competitively with cotton. Initial price is expected to be nearly half that of nylon. Its cheapness is due to its basic raw material: oil. Its main disadvantage: it can't be ironed as it dissolves at about 350 degrees F. This may not be important in bagging uses. Natta is due in New York in August.

Another New Fiber from Germany—West Berlin firm of Spinnstoff-Fabrik Zehlendorf AG has come up with new staple fiber, called Zehlasordin. It is supposed to repel water and dirt, yet be easily dyed.

Meanwhile Chemische Werke Huls AG has set up a pilot plant to make Vestolen, a polyethylene: about 50 tons monthly.

West Germany is plugging away at more man-made fibers in men's suits and by now has the greatest percent synthetics for suits in Europe. In coming months spring and summer weight ready-made suit output is expected to reach a half million. Some 200,000 of them will be made from blends of wool and Trevira, a polyester, or Dralon, an acrylic fiber.

Less Rayon, More Nylon in Belgium—Belgium's big Fabelta rayon and synthetic fiber works has shut down its Tubize spinning plant, cutting output thereby 7,850 metric tons a year. Poor demand for viscose textiles was Fabelta's reason for the move. But the concern's nylon factory at Zwijnaerde, which has been operating for about a year under the French Rhodiaceta license, will boost output three times and start production of industrial rayon.

More Troubles from Suez Closing—Rayon tire cord production had to be cut in the Netherlands and in Belgium. And in Britain, rayon prices were increased for the first time since 1951. Nyma, in Holland says it's still making rayon tire cord but at a sharply reduced level because of drop in automotive demand (due to gas shortage). Setilose, Fabelta's tire yarn branch, reported similar situation.

British Rayon, Acetate Filament Prices Up—Courtaulds started Britain's 10% price increase for rayon and acetate continuous filament yarns. It was shortly followed, by British Celanese and British Enka. However, staple fiber and industrial yarn prices held the line. Courtaulds is biggest UK rayon producer. The price hike may help smaller manufacturers who have been having a tough time with Suez-born cost rises and Courtaulds' competition.

Government Assist in Holland—A recent study in Netherlands showed textile productivity up 9% a few months ago above same period of previous year. Reason: The Government decided to help home market by ending the 4% textile products, sales tax. Domestic sales jumped 20%. The Government has decided to forget about the tax for future. Buyers and sellers are going about their business with renewed confidence and assurance that textiles will be free of sales tax. A.K.U. of Holland has taken over 75% ownership of St. Poeltener Glanzstoffabrik, Austrian rayon producers. Prewar, A.K.U. held about 48% interest. Output of the Austrian firm is being upped to 1,500 metric tons of rayon for clothing and 1,800 tons for tire cord.

(Continued on Page 64)

1956 U.S. Man-Made Fiber Output

TOTAL production of man-made fibers in the United States last year was 1,644,700,000 pounds, a decline of 4% under the all-time high of 1,715,800,000 pounds manufactured in 1955, according to the annual presentation of man-made fiber statistical data by the TEXTILE ORGANON, bulletin of the Textile Economics Bureau, Inc.

A decline in rayon and acetate production was offset in part by increased production of textile glass fiber and non-cellulosic fibers. Textile glass fiber output in 1956 totaled 96,900,000 pounds, an increase of 28% over the previous record of 75,800,000 pounds in 1955. Non-cellulosic fiber production in 1956 rose to 399,900,000 pounds, 5½% over 1955. There was a small decline of 1,400,000 pounds or ½ of 1% in filament yarn output, and a 22,000,000 pound or 21% increase in non-cellulosic staple and tow.

U. S. production of rayon and acetate yarn and staple during 1956 totaled 1,147,900,000 pounds, a decline of 9% from the 1,260,700,000 pounds produced in 1955. Output of all rayon and acetate products declined in 1956 from the previous year with the exception of rayon staple and tow which rose 1%. Decreases in other products ranged from 1% for acetate staple and tow to 16% in acetate filament yarn production. High tenacity rayon yarn output fell 14½% and regular and intermediate tenacity rayon yarn declined by 8%.

Producers' shipments of rayon and acetate totaled 1,126,800,000 pounds last year compared with 1,261,900,000 pounds in 1955, a decrease of 135,100,000 pounds or 10½%. With shipments off somewhat more than output, producers' stocks at the end of 1956 rose to 107,500,000 pounds, a figure 21,100,000 pounds or 24½% higher than the 86,400,000 pounds held at the end of 1955.

The ORGANON notes that the total available supply of rayon and acetate in the United States last year was 1,328,000,000 pounds, a figure 13% less than the supply in 1955. It consisted of 1,147,900,000 pounds produced, plus producers' beginning stock of 86,400,000 pounds and estimated imports of 93,700,000 pounds. The decline in supply resulted from a 9% drop in production together with a notable decline in imports. The latter amounted to 174,400,000 pounds in 1955.

The ORGANON tabulation of rayon and acetate output by product shows that output of high tenacity rayon yarn declined from 432,700,000 pounds in 1955 to 370,500,000 pounds in 1956 or by 14%; regular and intermediate tenacity rayon yarn from 202,300,000 to 186,300,000 pounds or 8%; acetate yarn from 230,100,000 to 192,800,000 pounds or 16%; and total rayon plus acetate yarn from 865,100,000 to 749,600,000 pounds or 13½%.

Rayon staple and tow production in 1956 at 341,000,000 pounds was up 1% compared with the 337,800,000 pounds produced in 1955. Acetate staple and tow at 57,300,000 pounds in 1956 was off 1% from the 57,800,000 pounds of 1955.

The ORGANON'S estimate of the 1956 available supply of rayon staple and tow is 430,600,000 pounds comprising production of 341,000,000 pounds less exports of 2,100,000 pounds and plus imports of 91,700,000 pounds. The supply available, therefore, was 15½% below the record supply of 509,500,000 pounds available in 1955. For acetate staple and tow, available supply last year was 54,200,000 pounds which included production of 57,300,000 pounds less exports of 3,100,000 pounds; this was virtually the same as the 54,100,000 pounds available in 1955. ■

U. S. Man-Made Fiber Production*
(in millions of pounds)

	1954	*1955*	*1956*
RAYON			
Regular tenacity filament yarn	169.8	202.3	186.3
high tenacity filament yarn	339.1	432.7	370.5
staple fiber and tow	311.5	337.8	341.0
ACETATE			
Filament yarn	197.9	230.1	192.8
Staple fiber and tow	67.4	57.8	57.3
NON-CELLULOSIC**			
Filament yarn	225.8	274.0	272.6
Staple fiber and tow	58.8	105.3	127.3
TEXTILE GLASS FIBERS	59.2	75.8	96.9
TOTAL MAN-MADE FIBERS AND YARNS	1,429.5	1,715.8	1,644.7

* Data in this tabulation is derived from the February, 1957 issue of the "Textile Organon", bulletin of the Textile Economics Bureau, Inc.

** This classification is sometimes referred to as the "newer" synthetics or the "true synthetics" to distinguish them from rayon and acetate which are made from cellulose. The classification includes nylon (polyamide) including caprolactum nylon; the acrylics (such as Orlon, Acrilan and Dynel); the polyesters (Dacron); polyethylene; protein fiber (Vicara); saran (polyvinylidene chloride) and such new fibers as Verel, Darlan and Zefran as well as others.

Fiber Identification

(Continued from Page 48)

Some General Observations

Persons familiar with the use of fusion methods should experience little difficulty in this application to synthetic fibers. For those with no prior experience in observing melting phenomena under the microscope, practice runs with known fibers are advisable before an unknown is undertaken. For example, it is sometimes difficult to distinguish between eutectic melting and shrinkage of the fibers, because the fibers when shrinking often drag along clumps of *p*-nitrophenol crystals, giving the impression of flow.

p-Nitrophenol sublimes above 80°C. when heated at the prescribed rate. Above about 90°C. it sometimes condenses on the bottom surface of the cover glass in droplets of liquid which, if not recognized as such, may cause some confusion.Therefore, with those fibers whose eutectic temperature lies above 90°C., indications of eutectic melting must be looked for in the fiber rather than in the *p*-nitrophenol.

Table I shows that the technique can distinguish between most fibers conclusively. For example, the fibers which melt by themselves can be immediately set apart from those which do not. Among those which melt, only Nylon type 66 and Dacron cannot be unequivocally distinguished by their melting points alone, and with this pair of fibers the eutectic temperatures are adequate to tell them apart.

In the group of fibers which do not melt by themselves there is only one pair of fibers which have nearly the same eutectic temperatures and behavior characteristics—namely, Orlon and Acrilan. In this case, although their behavior is sufficiently characteristic for an experienced operator to distinguish one from the other, confirmatory tests are indicated. Rayon, as well as the natural fibers cotton and wool, exhibits no visible interaction with *p*-nitrophenol.

The technique is applicable to staple and filament yarns and to bright and delustered fibers. With dyed fibers polarization colors are obscured, but otherwise there is usually no interference. Bulk polymers and films—for example, Mylar film—may likewise be identified with this method by using thin slices shaved off with a razor blade.

It is somewhat surprising that eutectic melting takes place under the circumstances described, in view of the lack of an intimate mixture of the two components. However, the eutectic is very sharp in some cases, as shown by the photomicrographs of Figure 1. This series of pictures shows unmistakable melting of Nylon type 6 with *p*-nitrophenol at approximately 40°C. below the melting point of *p*-nitrophenol and about 140°C. below the melting point of Nylon type 6. Figure 1, a, shows two filaments surrounded by fragments of *p*-nitrophenol crystals just before melting has begun. In Figure 1, b, melting has begun as evidenced by the curved, slightly swollen, and irregular outline of the filaments, and the rounding off and coalescing of *p*-nitrophenol fragments.

As the temperature continues to rise the melting proceeds faster and more obviously as shown in Figure 1, c and d. If at this point the slide is shifted to show a field containing an excess of *p*-nitrophenol, the fibers can be seen to dissolve completely at temperatures well below the melting point of *p*-nitrophenol. It is believed that the relatively high vapor pressure of the *p*-nitrophenol is responsible for the successful eutectic melting, the fibers being bathed with vapor of *p*-nitrophenol within the confines of slide and cover glass. Of a number of compounds surveyed as possible reference reagents, only those which exhibited a strong tendency to sublime also exhibited eutectic melting.

The results obtained also indicate the potential utility of fusion methods for other studies with synthetic fibers. For example, the change in the sign of elongation that occurs when Orlon is heated indicates structural changes in the nature of a second order transition.

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Editor's Note: The above article was published first in the October, 1956 issue of ANALYTICAL CHEMISTRY and is here reprinted with permission of the editor of that journal.

Europe

(Continued from Page 62)

East European Events—The East German Government-owned textile trade will build big synthetic fiber plant for Communist China. Construction is slated to get started in few months with plant ready for operation in 1959. The Chinese plant would have 688 centrifugal spinning machines and employ 1,000 workers. Discussions are underway for a Perlon plant as well. Meanwhile, a Prague report states Czechs have developed new process for manufacturing velvet plush carpets and imitation fur from Silon, a polyamide fiber.

Coming Trade Fairs—Britain's Textile Show, to be held March 4–8 at London's Earls Court, will have four separate expositions: a men's and boys' trade fair, a cloth fair, a household furnishings fair and a carpet and floor covering fair.

Snia Viscosa plans to participate in the New York Coliseum's April 14–27 World Trade Fair. Lombardy, Biella and Como weavers will predominate. . . . The 32nd International Trade Fair at Lille, France, May 4–19, will feature textile machinery. . . . The Austrian textile industry—centered at Dornbirn, Vorarlberg—will hold its annual event Aug. 2–11. German, Italian and Swiss cloths, plus new testing control mechanisms, will be shown.

Drycleaning Advisory Group

A Textile Analysis Advisory Committee has been set up to meet periodically to act on policy and procedural recommendations concerning the operation of the laboratory of the National Institute of Drycleaning, Silver Springs, Md.

The committee held organizational meetings in January and will meet again in April. NID's textile analysis laboratory annually investigates more than 25,000 damage complaints. It reports the results of its findings and indicates the cause of damage. Members of the committee are Charles W. Dorn, Mrs. Dorothy C. Matthai, Charles A. Seibert, and Miss Mary C. Whitlock.

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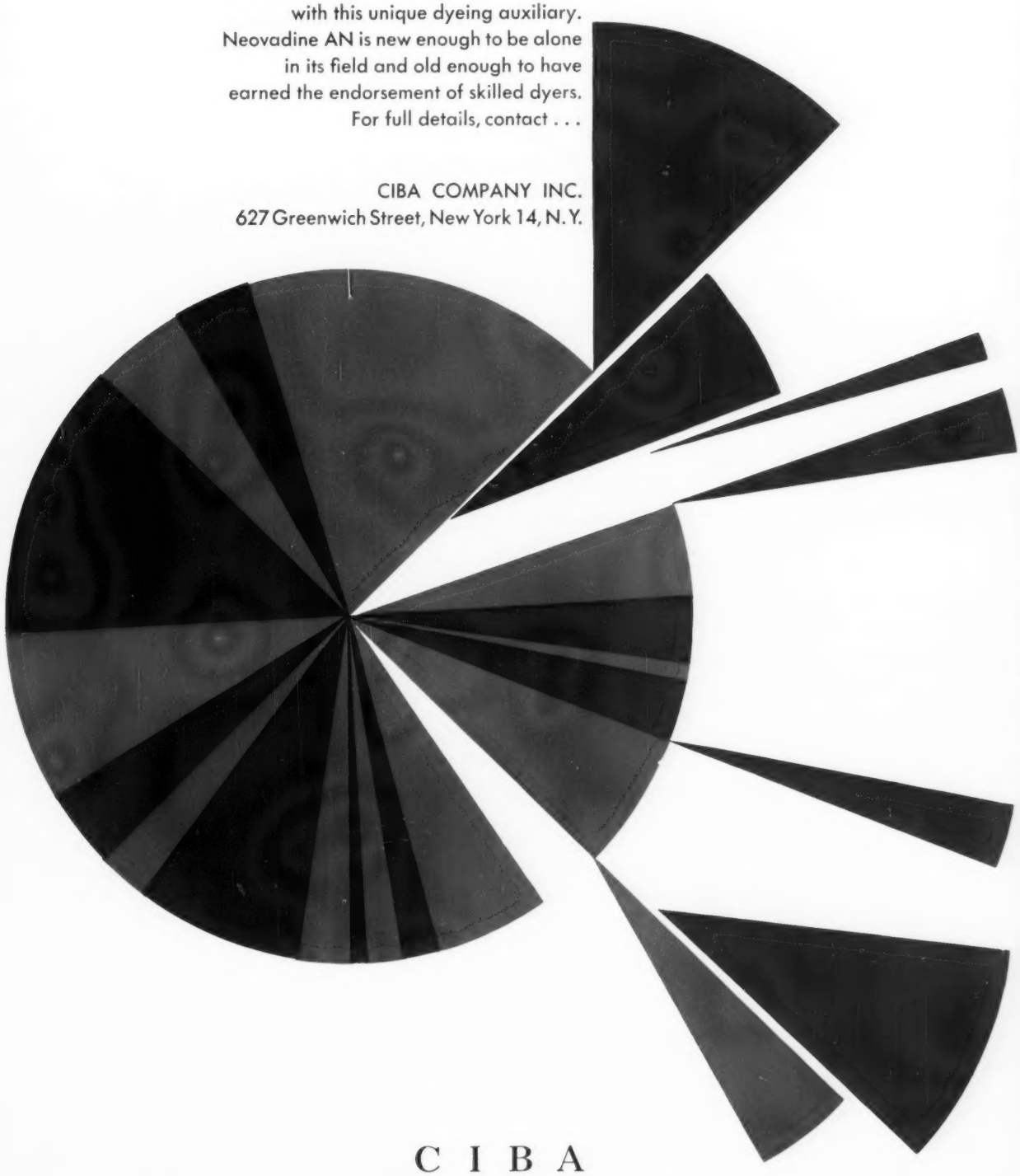

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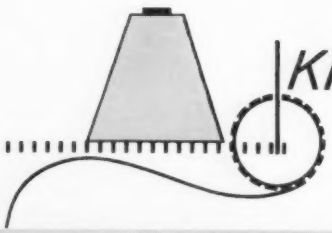

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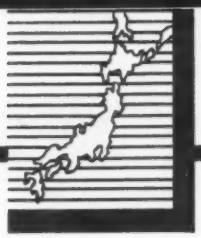
REPORT FROM JAPAN



Too much rayon staple output worries Japanese; Prices are down while curtailment talk grows

By B. Mori

OSAKA—Japanese rayon staple industry, which has doubled production in two years to hold top world position is facing an "over-production crisis." Almost two years ago, as reported on this page, some experts here felt that the rayon staple expansion program was going ahead too rapidly. Early last year the Government seemed ready to impose restrictions. Now, with record-breaking production of almost 700 million pounds behind them, and even higher average monthly rates in prospect for 1957, producers are being pressured to cut back.

There is no doubt that long-term prospects for consumption of spun rayon products, both at home and abroad, are favorable. But in the past two months there has been some "over-supply indigestion" in consuming and distribution pipelines.

Producers' Stocks Rise Sharply—Within a year, producers' stocks of rayon staple have grown from about three days' production to almost half a month's production. In Japan this assumes disproportionate magnitude as a problem. American and European rayon producers may be surprised at smallness of inventory figures involved. But they must remember that Japanese business firms are forced to do business on absolutely minimum inventories because of high interest rates on bank loans for working capital.

Price Cuts Upset Fabric Market—Oversupplies of staple have brought prices down, disturbing spinners, weavers and fabric distributors because of unsettling effect on their prices. It is reported that recent staple prices have been hovering at break-even-point for rayon producers. Cries have come from all sides for voluntary agreement on production cutback to affect principally plant capacity added in past two years, and not all producers. This would penalize progressive firms who are building today for the future. Some in the industry would prefer aggressive market promotion to cutback whose effects would be only temporary benefit to some, and would penalize others.

Bitterness Over Quotas Expressed Here—Most of Japan's cotton-textile manufacturing and export business is centered in this city, so it is natural that feelings about new quotas for United States should be strongest here. These feelings are almost unanimously bitter. General belief is that Japan has conceded much to American pressure, but gained little.

Japanese textile leaders are outspoken in declaring that quota agreement is one-sided "compromise", and that it is ridiculous to call quotas "voluntary." They point out that cotton fabric quotas are broken down in such a way that Japan cannot possibly sell the full 113 million yards permitted. Apparel and household products quotas are so arranged that, in practically all cases, permissible quantities are far below sales potential.

Expect Action on State Laws—Quota agreement is basically valid for five years. In conceding this point, Japanese are anxious to see what Washington can do about discriminatory state laws. Eisenhower's rejection of higher velveteen tariffs, and subsequent withdrawal of tariff complaint on ginghams are, in meantime, sources of satisfaction here.

Those who are anxious to see quota system receive fair trial are disturbed about reports of possible trans-shipments via Hongkong. This evades quotas in spirit if not in letter, and would be difficult to control or to keep track of.

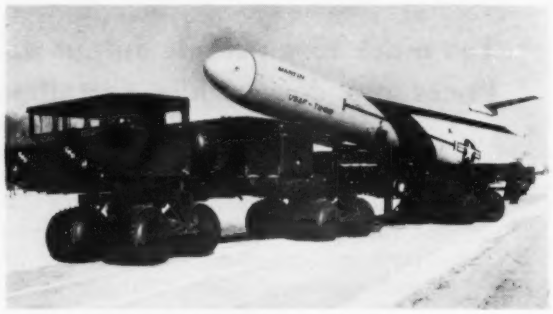
Man-Made Output at New High—Production of all man-made fibers aggregated 981 million pounds in 1956, the Japan Chemical Fibres Association reports. This is 28% over 1955 and new record high. Detailed figures are not yet available.

Exports of silk fabrics in 1956 to all countries totalled 46 million yards, second highest postwar figure. The Government predicts a further 30% gain in 1957, which would be new postwar high. Exports of raw silk declined from 87,000 bales in 1955 to 75,000 in 1956; to the U.S.A. from 55,000 to 52,000. Chinese silk is eating into Japan's market in Europe.

NEW FABRICS

NEW YARNS

Lots of Nylon Used Here



Tires of nylon made with a bead wire of steel provide the barrel-shaped wheels for this truck and semi-trailer used by the Air Force to transport and launch the Matador missile. These vehicles, named Teracruzer and Translauncher respectively, made their first appearance in the recent inaugural parade in Washington, D. C. The walls of the tires are relatively thin and flexible so that the tires can wrap themselves around stones and other obstacles. Air pressure is only three to seven pounds per square inch.

New Dynel for Carpets

Carbide and Carbon Chemicals Co., division of Union Carbide and Carbon Corp., recently announced successful production runs of new Dynel acrylic fiber made especially for carpets. Dynel carpets are said to resist burning, sunlight, insects, molds and mildew. At the Chicago Market, Mohawk displayed its Dynel carpet tradenamed Insignia. C. H. Masland and Co. displayed its new Dynel carpet called Dynamic. Dynel carpet yarns are being made with 18-denier fiber and prices are comparable to that of wool.

New Carpet Acetate

A special acetate for use, blended with nylon, in textured and frieze type carpets, has been developed by Celanese Corp. of America. This new fiber when used in rugs and carpets is said to have permanent texture, resistance to crushing and matting, improved resiliency, cleanability and resistance to insects and soilage. *For further information write the editors.*

Knitting Show

(Continued from Page 8)

The exhibition is under the sponsorship of the National Association of Hosiery Manufacturers, the National Knitted Outerwear Association and the Underwear Institute. Attendance at the last Knitting Arts Exhibition in 1955 was 9,500.

It is expected that automation of knitting and knitwear finishing equipment as well as yarn preparation machinery will be a dominant theme at the exhibition. Reservations already made by exhibitors reveal that virtually every type of machinery and supplies used in the manufacture and finishing of knitted fabrics and apparel will be displayed. Producers of man-made fibers and yarns will have elaborate displays while leading manufacturers of yarn processing, knitting and dyeing and finishing machinery will have, to a large extent, working demonstrations of their equipment.

Requests for exhibit space and for information about the Exhibit should be addressed to the Knitting Arts Exhibition, 332 Park Square Building, Boston, Mass., or the the Exhibition's New York Offices, 468 Fourth Ave., New York 16, N. Y.

Economist says converters now have better chances for good business

TEXTILE markets are currently entering a new phase in which the independent converter of man-made fibers will have every opportunity to re-establish himself in his former importance, A. W. Zelomek, an economist, recently told a meeting of the Textile Salesmen's Association. Mr. Zelomek is president of the International Statistical Bureau, Inc.

He pointed out that a number of important factors were working to provide increased profits in textile manufacturing and marketing in the next five or ten years. Among these he said, were the rapidly increasing population and a constantly rising standard of living that leads to increased demand for better and more highly styled merchandise. In addition, he said, liquidations of mills and machinery during recent years has brought the textile industry to the point where the industry if it chooses, can operate steadily at near capacity without need for profit-destroying price cutting.

This expected strengthening of the cloth mills' position, Mr. Zelomek declared, presents the independent converter with a great opportunity and a great challenge. He cautioned, however, that despite the "recently demonstrated failures of large-scale mill verticalization in the field of women's fashion fabrics, the independent converter should not assume that the future belongs to him." It will only belong to him if he adapts himself to changing circumstances.

"Mills will need the converter, but mills may not need all converters or as many as they depend upon today. The mills will be able to select their gray goods' outlets more discriminatingly than ever before. Without question, they will favor those distributors who constantly and effectively prove a source of strength to the weaver. They will turn away from the converter who does not have something constructive to offer, whether it be styling skill, dynamic distribution, or merely a philosophy of live-and-let-live.

"There is nothing unique in this philosophy. Strength among converters has always made for strength among mills, just as weakness at either level has always tended to undermine both. But in the new era the old philosophy will be activated. There will be absolutely less room for either incompetence or mere opportunism. Coming events almost always cast advance shadows, and in the economy of today we can already discern some of the basic characteristics of future mill-converter relationships.

"For one thing, teamwork between mills and converters in the development of new styles is already making rapid strides. The best results, needless to say, are being accomplished where there is an equality of skill and know-how among the members of the team.

"The need for skill and know-how was never greater, due to the complexities injected into fabrication by the continuing stream of new fibers and new processes. Today, mill stylists and technicians often have a working knowledge quite superior to that of the average converter. The converter of the future must place himself on a more equal footing with the weavers with respect to creative knowledge.

"Those converters possessing these dynamic qualities are already receiving preferential treatment from an increasing number of mills, preferences that go beyond old-fashioned concepts of price favoritism. Size of distribution is still an important factor in bringing mill and converter closer together, but it is not always the over-riding consideration. The more far-sighted mill managements are, in fact, favoring dynamic ability among their customers regardless of size. Such mills are on the look-out for up-and-coming converters who possess the prerequisites that make for mutual growth. New converting organizations that can boast such qualities will receive every encouragement from mills. Older organizations, not blessed with a continuing line of successors capable of taking a modern approach to the market, are destined to pass out of the picture."

Mr. Zelomek pointed out that the economic pressures which did so much to encourage cheapening and prices cutting in textiles are now beginning to relax. The textile industry, he said, is reaching a position where supply and demand will be in better balance than at any time in this generation. An opportunity is developing, he told his audience for converters to begin to think of pricing on a quality and value basis rather than on a purely competitive basis.

In some respects, he declared, converters' risks will increase since styling and sponsorship of new ideas involves risks as does the buying of seasonal goods out of season. But these risks, which cannot be avoided, will, he said, "open the door to what I believe will be the greatest opportunity in history for the independent converter, particularly of man-made fiber fabrics."

Plan to Enlist Younger Men

Plans are under way to stimulate greater interest among the younger men in the industry in the work of the Textile Distributors Institute. The basic purpose of the plan is to explain to junior executives in the industry the urgent need for a trade association and to persuade these younger men and women to become actively interested in the TDI. In this way, it is expected that helpful new energies may be drawn into the work of the Institute and that new and useful ideas may be obtained.

Members interested in furthering this effort are invited to send in the names of younger executives on their staffs so that they may be contacted.

PAPERS OF THE
AMERICAN ASSOCIATION FOR
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AATT

Improved filament nylon dyeing

By Walter H. Hindle

THE purpose of this paper is to discuss dyeing of filament nylon in yarn, package, woven piece, knit piece and half-hose form by the newly developed Chemnyle method of filament nylon dyeing. When nylon fabrics of real commercial value were first developed, it became obvious that, because of inherent qualities of filament nylon and its susceptibilities from a processing standpoint, level dyeing and colorfastness were going to present a serious problem.

Unlike other man-made fibers that issued after the entry of nylon into the textile market, there were no insuperable difficulties in applying color per se, but it soon developed that the choice as to method of dyeing lay between the use of dispersed acetate dyestuffs which gave good dyeing uniformity and poor overall colorfastness and wool dyestuffs which gave good colorfastness but poor coverage of the non-uniformities existing in filament nylon yarns and fabrics.

The method selected eventually was a compromise and one in which attempts were made to combine the advantages of both systems without incurring the disadvantages of either. For a number of years, therefore, dyers have been using mixtures of disperse and neutral acid types for dyeing filament nylon and have labored between the devil of colorfastness and the deep blue sea of levelness to the complete satisfaction of no one.

Presented at the February 6, 1957 Meeting of the American Association for Textile Technology, Inc.

Walter H. Hindle

Mr. Hindle is associate director in charge of textile research of Chemstrand Corp. His responsibilities include the overall direction of the dyeing, finishing and textile processing work at Chemstrand. Before joining the company in 1954, he was in charge of dyeing research for Burlington Mills. He has also worked for Celanese Corp. of America, Dominion Textile Corp. in Canada and the Bradford Dyers' Association in England. He studied dyeing and finishing at Manchester College of Technology.

The net result has been that, although nylon has been in the textile field for 17 years, it can be truthfully said that at no time has the dyeing been worthy of the fiber. On the one hand, we have had fabrics that, because of fiber properties, have been well able to withstand the rough and tumble of vigorous wear; but, on the other hand, have met with limited acceptance because of washfastness requirements contingent upon vigorous wear.

How many textile people and consumers have had personal experience in observing that, whereas filament nylon blouses and lingerie have provided excellent lasting qualities but have been discarded because of loss of color to a point unacceptable to the wearer? Brightness of shade, which is so important in stimulating my lady's fancy, has been greatly limited by the need for using dispersed dyestuffs, whereas the acrylics have forged ahead in a number of fields where shade brilliance is important. How many of us have had difficuties with nylon half-hose where dark shades have bled freely even after numerous washings?

The development of texturizing processes has greatly widened the scope of filament nylon products, but at the same time dying difficulties have been greatly increased. The consumer is not apt to regard second quality merchandise as being of any of his immediate concern, but from a factual standpoint, of necessity, first quality merchandise must carry the cost of seconds. In certain textile fields, particularly half-hose, seconds have run alarmingly high due to the lack of dyeing uniformity which manifested itself in rings and flashes. With the increasing colorfastness that has been developing on other fibers, both natural and synthetic, filament nylon has been at an extreme disadvantage from this competitive standpoint. It became obvious that the situation could not be permitted to continue if nylon, in the apparel field, were not to be seriously handicapped.

Because of the Chemstrand Corp.'s great interest in filament nylon, it obviously became a matter of primary importance that the aforementioned difficulties be overcome. Therefore, almost 18 months ago, a team consisting of a dyeing scientist, an application chemist, a plant chemist and dyer, with several assistants, was organized based on the premise that any finalized method must find acceptance on the part of each of these elements and that each one had much

to contribute towards the development of a practical method that would work on a commercial scale. The scientist concerned himself with the study of dyeing mechanisms in relation to nylon fabrics and yarns containing dye level variation potentials from known causes.

For example, a fabric was made with yarns containing streaky dyeing potential for reasons of variation in orientation brought about by stretching or relaxing under controlled conditions. Another study involved a deliberate and well considered chemical variation of the nylon itself insofar as amino and carboxylic end-groups were concerned to an extent not considered possible of reproduction under the normal control conditions of nylon manufacture. Still another study was based on streakiness deliberately induced by variations in the various texturizing processes.

Three Approaches Considered

Three main avenues of approach then presented themselves. The physical differentials could possibly be equalized by an attempt to remove the variations in fiber orientations by means of fiber swelling. A second approach lay in mordanting the variations in such a way that the mordant itself became the controlling factor in uniformity rather than the nylon. The third alternative was to consider changing the dyeing mechanism of dyestuffs known to have good fastness properties on nylon in such a way that they would more nearly conform to those of disperse dyestuffs which normally give excellent uniformity.

The dyer and the plant chemist rejected the first idea on the basis of cost and difficulties in handling. It was pointed out that the dyeing of filament nylon is a highly competitive operation and the cost incurred by the use of swelling agents, together with the extra processing required to remove them, would make such a process not commercially profitable. The application chemist rejected the second alternative on the basis of problems of control and, therefore, the scientist was left the last alternative.

The scientist's first approach was to determine by what means acid and direct dyestuffs known to possess good fastness on nylon could be precipitated from solution and then be redispersed. Precipitates based on excess acid were found to be of no value because of a redispersion under conditions of high acidity promoted a rapid dye strike and a multiplicity of dye spots and blotches. Precipitation by the addition of electrolytes proved quite impractical of application because of the effects of these salts on the dispersants and the extremely slow rate of dyeing made for extremely long dyeing times and limited build-up in shade.

A wide variety of cationic materials including quarternary ammonium salts was studied in relation to their ability to precipitate direct and acid dyestuffs in such a way as to be subsequently redispersable. A number of these types of material were evaluated with great degrees of differences in the kind of result obtained. Some of the precipitates became too highly aggregated such as to cause color spotting. Other types of precipitate provided a particle size too great to permit effective penetration. Still other types of precipitate would cause a rapid plating of the surface of the fiber without effective penetration.

It was from this welter of confusing results and using the microdyeoscope as a tool that the dyeing scientist was able to determine the precise type of redispersable precipitate that would dye filament nylon to cover non-uniformities within commercial dyeing times. Another factor that had to be taken into consideration was that many of the materials used had an adverse effect upon lighfastness and this problem posed a stumbling block for many weeks.

When what appeared to be the ideal type of dispersion was obtained, consideration then had to be given to problems which were encountered in governing rates of dyeing. Evaluation of 220 direct and acid dyestuffs developed the information that approximately 35 could be applicable to filament nylon by what was now known as the Chemnyle process. However, there were three separate and distinct groups of dyestuffs within the first 35 that could be classified as rapid, medium and slow dyeing. Although, by then, excellent self shades were being obtained that indicated freedom from streaks and flashes, the problem of tertiary combinations still remained unsolved.

Considerable study was, therefore, given to the selection of dyestuffs with similar dyeing rates under the conditions of the Chemnyle system of dyeing. As a result of this study, a full color range was developed that may be applied to filament nylon using tertiary combinations whose constituent parts draw at the same rate. Using the selected combinations of dyestuffs which could be all acid colors or all direct colors, or mixtures of each, and under standard conditions of pH, a full shade range of shades with freedom from the usual streakiness and with the kind of colorfastness normally associated with those dyestuffs on nylon became available. It should be pointed out that the Chemnyle process per se does not improve colorfastness but permits the application to filament nylon of many of those dyestuffs which normally have good fastness properties but which dye in non-uniform fashion.

Production Tests Made

At this juncture, it became obvious that the rapidly developing process had remarkable commercial possibilities and for purpose of commercial reference the name of "Chemnyle" was given to the process. Reduction to commercial practice was carried out on production scale on shades selected by dyers as those normally presenting major difficulty insofar as uniformity was concerned. In the woven field, the shades usually selected were tans and greys; in the tricot field, brilliant scarlets and pastel blues; in texturized nylon sweaters and half-hose the same series of shades was called for. No work was carried out in the women's hosiery field initially as colorfastness was not considered a serious problem as washing temperatures in this field seldom exceeded bearable hand temperatures and the need for laundry washing did not exist.

The results of the first production trials entirely confirmed laboratory findings. It thus became obvious that the commercial aspects of the process were far reaching. Not only was the colorfastness of filament nylon dyed goods going to be radically increased, but also color styling had become a factor based on the availability of brilliant colorings provided by acid dyestuffs formerly not usable because of non-uniform dyeing properties. The question of seconds due to non-uniform dyeing also came into consideration which, combined with the other advantages, emphasized the potential impact of the Chemnyle process on filament nylon from a commercial standpoint.

A summation of the results obtained from the Chemnyle process thus far shows that:

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Schreiner calendering of nylon tricot

By Graham M. Richardson

An interesting new finishing technique has been developed for nylon tricot. It is called Schreiner calendering. The process consists of passing nylon tricot fabric through a Schreiner calendering device under conditions of temperature and pressure so selected as to impart an entirely new character to the fabric. Schreiner calendering itself certainly is not new to the textile industry. It has been used successfully in the finishing of millions of yards of cotton broadwoven goods. Now, in our opinion, Schreiner calendering of nylon tricot promises to have far reaching effects on the entire tricot industry—enlarging present end uses and providing entirely new ones.

The process gives a matte or frosty subdued appearance suggestive of a woven rather than a knit construction. The high pressure exerted by the calender tends to flatten the individual yarn bundles thereby reducing the openness of the stitch and at the same time imposing the fine engraved pattern of the steel onto the fabric surface. This produces an increase in covering power or fabric opacity as measured both by appearance and laboratory tests. In addition, a very marked and pleasing change in hand results.

Schreiner calendering was adapted to tricot in Du Pont's Textile Research Laboratory and is being presented as a service to the tricot and lingerie industries. While the process has been demonstrated successfully on what is considered semiworks scale, commercial acceptance is not an accomplished fact at the moment. However, Du Pont is working with the industry to critically examine this development, appraising its merits with regard to practicality, economic feasibility, and value to the consumer.

Commercial Significance

Schreiner calendered nylon tricot possesses characteristics that promise to improve its acceptability over tricot finished by conventional processes. The entirely new appearance and handle of Schreiner calendered tricot fabric is so different that it has focused the attention of the tricot industry on this fabric for new applications and expansion of the present end uses. The change in appearance is largely due to the light scattering effect of the engraved pattern on the surface of the fabric thereby imparting covering power. The accompanying condensation of the fabric resulting from the pressure in the calender tends to add further to the covering power.

The hand of the fabric is altered because of the decrease in thickness and the change in surface frictional characteristics. The surface is smoother since the fabric is more compact. This tends to reduce the sleazy character of some fabrics and equalizes the points of contact encountered by the hand when touching the fabric. The factors which contribute to the new handle and appearance are made possible by the thermoplastic nature of nylon. This permits the shaping of the fiber and its surface under the calendering conditions wherein heat and pressure impart durability. The effect is not appreciably altered by home laundering treatment.

Finishing Process

By the use of Schreiner calendering, light denier all dull tricot fabrics can be produced with improved smoothness, cover, handle and thinness. These fabrics also retain a high degree of their original porosity with practically no loss in bursting strength. Porosity or air permeability of the calendered fabric will depend largely on its original construction in terms of rack length, runner length and gauge as well as finishing conditions. Calendering promises to offer a means for producing a new high level in thin fabrics with a high degree of opacity yet retaining porosity for air passage.

Up to now nylon tricot has enjoyed excellent success because of its good appearance, handle, and washability. Schreiner calendered tricot offers a fabric with a new appearance and greatly improved covering power and handle. The Schreiner effect produces the desired fully delustered appearance with excellent whiteness. This improvement in present high quality fabrics should further enhance the acceptance of tricot and expand its uses.

Another advantage is a more effective print base. Printed tricot is usually characterized by its poor definition of pattern due mainly to the sheerness of this fabric. Schreiner calendered tricot, has increased cover and an accompanying improvement in fabric smoothness thereby providing an improved print base. Printed calendered tricot shows clear definition of patterns with good color cover and improved opaque backgrounds which produce a much clearer printed effect.

Single fabric with double fabric coverage is achieved in this process. Laboratory measurements of the "see thru" cover of tricot fabric has demonstrated that one thickness of Schreinered 40 denier dull

Co-authors with Dr. Richardson of this paper are: Bharat J. Gajjar, Harold B. Sturtevant, Jr., and Huntington Jackson, all of the Du Pont Co., Wilmington, Del.

Graham M. Richardson

Dr. Richardson is supervisor of dyeing and finishing in Du Pont's technical service section. Since joining the company in 1939, he has been associated with many projects for improving the methods of dyeing and finishing synthetic fibers. He holds a B.S. degree in chemical engineering from University of Tennessee and a Ph.D. in organic chemistry from Massachusetts Institute of Technology.

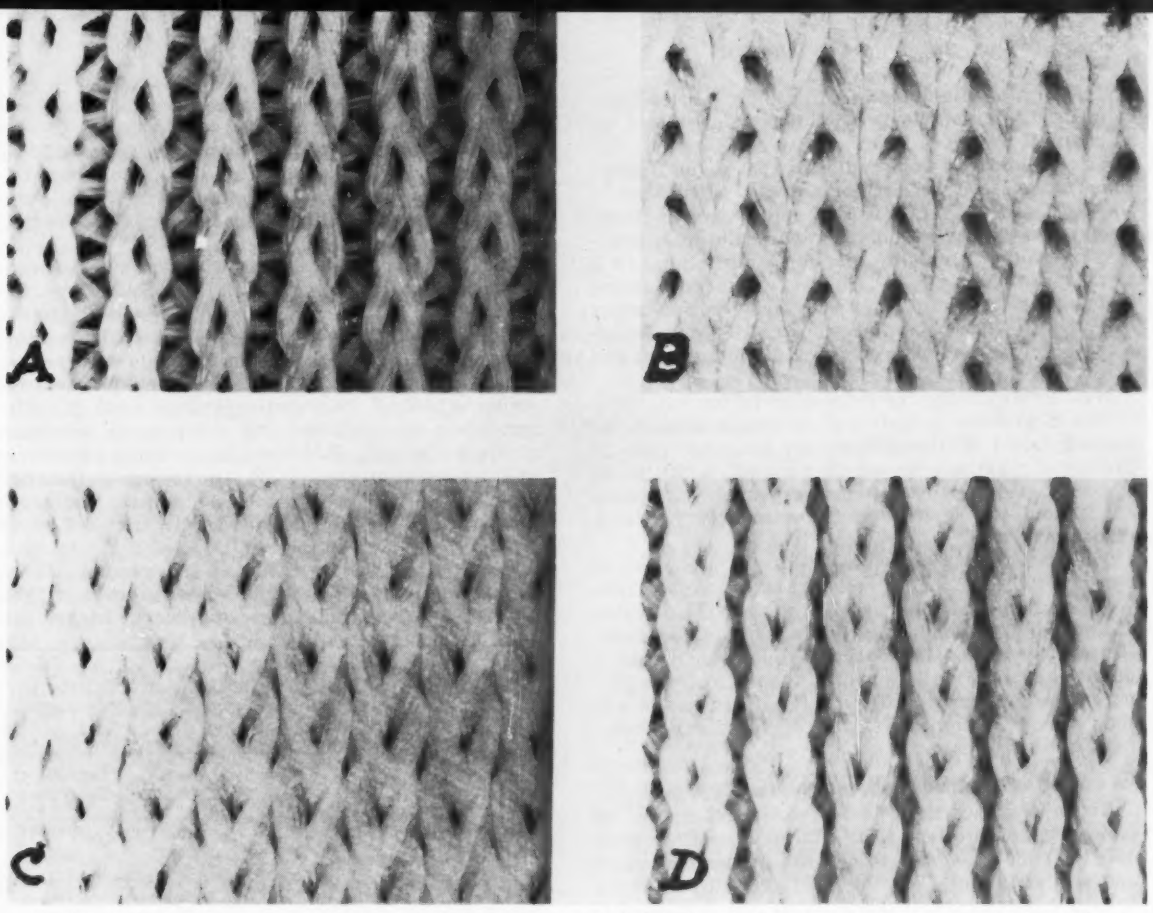


Fig. VII—A. Control—scoured—not calendered. B. Scoured—calendered. C. Calendered in the greige. D. Final calendered finished fabric. 40 denier 2 bar all dull (Type 680) nylon. Yield about 5.5.

fabric is roughly equivalent to two thicknesses of the same fabric prior to Schreinering. It is expected that this observation will find practical utility in 20 and 30 denier fabrics as well as 40 denier.

In dresswear, Schreinering of nylon tricot fabric appears to make it especially adaptable to that use. One of the difficulties with normal tricot fabric is its tendency to distort and sag. This is most noticeable at the hemline and has probably limited the use of nylon tricot in dresswear. This problem has been accentuated because of the attempt to produce fabrics with sufficient cover by the use of heavier knit constructions. Schreiner calendering gives adequate cover to light weight fabrics thereby minimizing the distortion problem. In addition the calendering operation compresses the fabric to a structure characterized by its thinness and draping properties resembling a woven fabric. The Schreinered tricot has shown indications of improved cutting performance.

Process

Briefly, the normal process for finishing nylon tricot consists of the following operations arranged in various sequences: scour, heat set and dye or bleach. The sequence of these operations vary from one finisher to another.

Schreiner calendering will constitute an additional operation in this sequence and may be introduced at any point during the finishing operation. However, the practical possibilities appear to place calendering in conjunction with one of the following.

1. Calendering in the greige (wet out and framed for width uniformity.)
2. Calendering following dyeing and drying.
3. Calendering as a final finish.

In all cases the engraved pattern of the Schreiner roll is imposed onto the surface of the fabric and a change in appearance and opacity occurs. However, depending on where calendering is introduced, there are differences in handle, opacity, thinness and durability of the calendered effect to home laundering.

Calendering of nylon tricot in the greige has the effect of reducing fabric streakiness generally caused by uneven spacing of the yarns. It mechanically flattens the stitch while simultaneously causing the yarn to shrink and retract thereby tending to minimize fabric irregularities. Tricot fabric which has been scoured prior to calendering has already been subject to yarn shrinkage. Fabric so prepared is therefore only subject to receipt of the engraved pattern and flattening and closing of the stitch. Subsequent heat setting insures the durability of the calendered effect, produces dimensional stability and releases stresses created by the calendering operation. A full, well bodied handle is imparted by this heat setting operation.

Final calendering of tricot, fully finished by conventional procedure, is the least amenable to the calendering effect. This behavior is to be expected since fabric so finished has already been subjected to prior heat treatment. Final Schreiner calendering imposes the engraved lines on the fabric and imparts covering power. However, the effect is less durable than that produced on fabric which has not been heat set. In addition, a firm handle results and wash and wear properties are damaged. A comparison of fabrics produced under these conditions is shown in Fig. VII.

Optimum handle is produced on most fabrics when calendering is followed by either heat setting or mechanical wet working in a dye box.

Brief laboratory work indicates that revised fabric constructions are needed to take full advantage of the effects of Schreiner calendering on nylon tricot. Dull yarns appear to yield better results than semi-dull or bright yarns. In order for a fabric to show a significant increase in covering power to calendering it must have a certain level of covering power before calendering. The best fabric construction may be arrived at by empirical procedures involving trial and error.

Now let's examine the *process variables.*

The Schreiner calendering operation consists of passing tricot fabric through the calender rolls at pressures ranging between 30 tons/48" width to 40 tons/48" width; at temperatures ranging between 380°F. and 400°F. and speeds between 13 yds./min. and 20 yds./min.

The above conditions were developed as a result of several studies of the variables of the process. These were carried out by Bharat Gajjar and Huntington Jackson in Du Pont's Textile Research Laboratory. In order to define the optimum operating range, a quantity of 2 bar dull 40 denier nylon tricot was prepared for the study by scouring and drying. It was then calendered under a variety of conditions of temperature and pressure.

(a) Study of Schreiner Roll Temperature

Figure I shows the effect of roll temperature on transmitted light cover (I_t).* Roll temperatures from 100°F. to 400°F. were used and roll pressure was held constant at 30 tons. Transmitted light (I_t) was 14.5% for the scoured control fabric. This was decreased to 11.5% by calendering at 100°F. This value decreased almost linearly to a value of 5.6% at 400°F.

The improvement in reflected light cover** is shown in Figure II where the reflected light value (I_r, %) is plotted against roll temperature. The reflected light cover (I_r) was increased from 66% for the uncalendered fabric to almost 80% for the fabric calendered at 400°F. The appearance of the curve suggests that the reflected light cover is approaching a maximum at this higher temperature.

Figure III shows the effect of roll temperature on fabric thickness. The stability to boil-off of this effect is also indicated. Thinness is believed to be desirable for improved handle. At low temperature thickness was decreased from 12 mils for the uncalendered fabric to 10.5 mils but the effect was not stable to boil-off. At high temperature (400°F.) thinner fabric was obtained (8.5 mils) which was more stable to boil-off. For illustration fabric calendered at low temperature (100°F.) increased in thickness from 10.5 to 12 mils on boil-off whereas the fabric calendered at 400°F. increased only from 8.5 to 9.5 mils.

Fabric construction change (shrinkage) during calendering at various temperatures is shown in Table I. In general, shrinkage was higher at higher calendering temperatures. Tension on the fabric during calendering tended to increase shrinkage even at lower temperature. This construction change in calendering is of primary interest to the manufacturer

TABLE I
SHRINKAGE DURING SCHREINER CALENDERING ON 40 DENIER DULL NYLON TRICOT (COURSES AND WALES/INCH)

Roll Temp.	*Course/ Inch*	*Wales/ Inch*	*Total No. of C & W/Inch*
Not Calendered	50	48	98
100°F.	52	48	100
200°F.	51	49	100
300°F.	52	50	102
350°F.	52	51	103
400°F.	53	50	103

* Transmitted light (I_t) is a measure of "see thru" cover. A practical goal is considered to be 5%.

** Reflected light cover (I_r) is a measure of the contact cover of a fabric. A practical goal is considered to be about 75%.

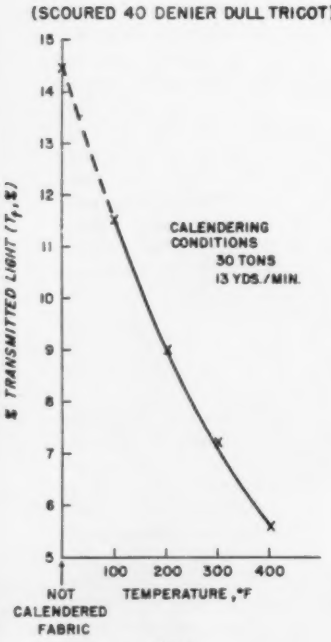


Fig. I

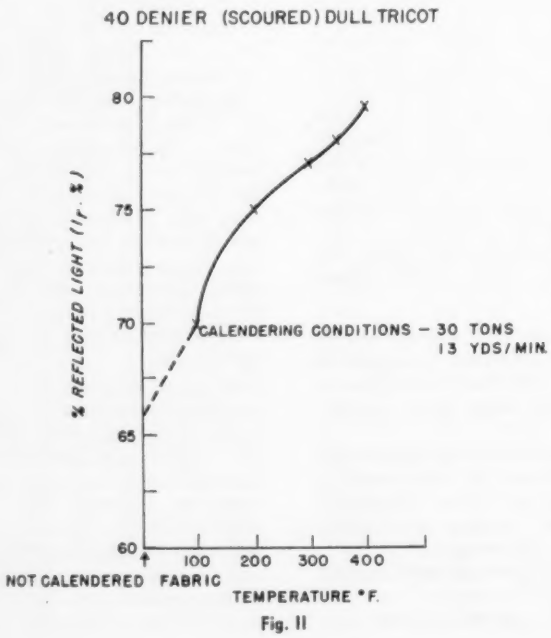


Fig. II

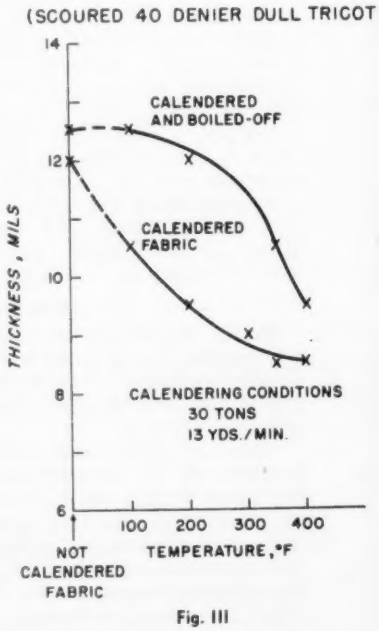


Fig. III

because it must be compensated for in knitting, or in finishing before calendering, if fabric of a prescribed width and weight are to be obtained.

The test fabric, scoured commercially, had relatively high shrinkage on boil-off (10%). It must be pointed out that the shrinkages of this fabric in calendering, as shown in Table I holds true only for this fabric or a similarly constructed one. Tricot fabrics knit with a tighter construction, or scoured in a relaxed condition, would shrink less during calendering, while those knit with a looser construction, or pulled out further during scouring, might be expected to shrink even more on calendering.

The boil-off shrinkage of fabric finished under a variety of conditions is given in Table II. Total boil-off shrinkage of less than two courses and wales is considered satisfactory. These data show that calendering does give some heat setting; however, even at 400°F., the test fabric was not stable to boil-off. (As noted this fabric had been scoured and dryed under tension and was open in construction; other fabrics with tighter construction have shown satisfactory shrinkage after calendering.) Dimensional stability was achieved by relaxed heat setting after calendering.

TABLE II
EFFECT OF FABRIC FINISHING ON BOIL-OFF SHRINKAGE

Fabric Finishing Treatment	*Increases in Course and Wale Count on Boil-Off**
Scoured and Dried	6
S + D + C (100°F.)	5
S + D + C (100°F.) + HSR	3
S + D + C (200°F.)	6
S + D + C (200°F.) + HSR	2
S + D + C (300°F.)	4
S + D + C (300°F.) + HSR	0
S + D + C (350°F.)	3
S + D + C (350°F.) + HSR	0
S + D + C (400°F.)	3
S + D + C (400°F.) + HSR	0

S = Scoured
D = Dryed
C = Calendered
HSR = Heat-set Relaxed
* Increase of 2 or less is considered satisfactory.

(b) Study of Roll Pressure

In this study roll temperature was held constant at 400°F. and the fabric (same fabric used for study of temperature) was given two passes. The roll pressure was varied from 10-45 tons. In general, the effect of pressure, in the test range, was much less critical than was the effect of roll temperature discussed in the previous section.

Figures IV, V, and VI give the effect of roll pressure on transmitted light cover (I_t), reflected light cover (I_r), and thickness. In each case most of the effect of calendering is achieved at 10 tons, further increasing pressure gave continued but only moderate improvements in each of the properties measured.

(c) Permanency of Calendered Effects to Washing

Data showing durability of the calendered effects to repeated home laundering cycles are given in Table III. The scoured commercial fabric was given three finishing treatments including: heat setting, calendering, and calendering followed by heat setting. The

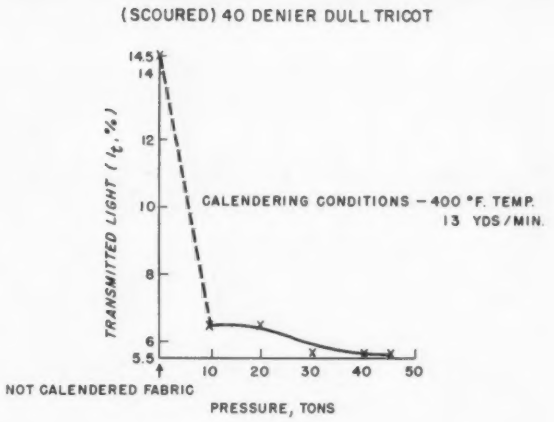


Fig. IV

TABLE III
EFFECT OF WASHING ON PROPERTIES OF CALENDERED TRICOT FABRIC(1)

	Thickness		*I_t(3)*		*I_r(4)*	
	Before Wash	*After Wash(2)*	*"B"*	*"A"(2)*	*"B"*	*"A"(2)*
Heat-set Control	11.5	11.5	12	13	73	69
Not Calendered	8.5	10.5	5.6	7.9	80	76
Calendered-Heat-Set	8.5	9.0	6.6	7.9	80	77

(1) 2.78 oz/yd.² 40 denier dull tricot. Fabric was commercially scoured and dried before calendering. Calendering temperature was 400°F., pressure was 30 tons, two nips.
(2) 10 complete agitator machine washings and 3 tumble dryings.
(3) I_t = % visible light transmitted through fabric.
(4) I_r = % reflected light cover.

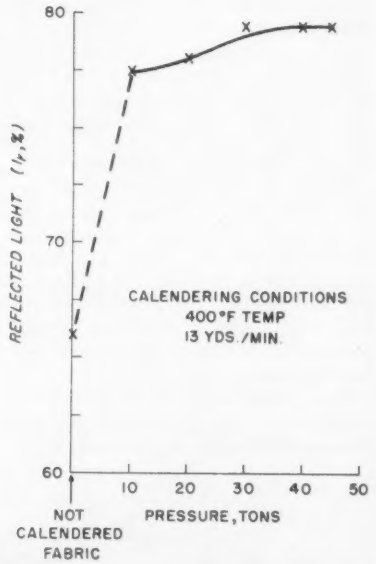


Fig. V

data show that the calendered fabric loses practically all its thinness improvement during washing. Heat setting after calendering gave excellent durability to the reduction in thinness. Although some of the improvements in cover obtained in calendering were lost in repeated washings, the final cover was still much better than that of the control.

At this point, it is appropriate to examine the *procedure for finishing*. It should be pointed out that all aspects of Schreiner calendering of nylon tricot have

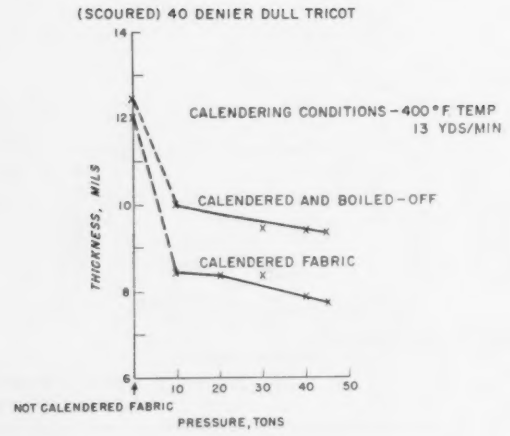


Fig. VI

not yet been explored. For instance, the effect on fabric dyeability has not been determined. The present paper is a progress report.

Work to date indicates the following procedure to produce optimum results by Schreiner calendering of nylon tricot: Scour, dye or bleach, and oil.
Dry, allowing for calendering shrinkage (about 3%).
It should be noted here that for optimum handle, the fabric should be calendered dry. Schreiner calender—

pressure — 30 to 40 tons
temperature — 380° to 400°F.
speed — 13 yds./min. to 20 yds./min.

Relax heat set at calendered dimensions.

While these conditions appear to be optimum at the moment, those undertaking calendering for the first time should examine all three of the approaches to calendering: namely, in the greige, after scouring and dyeing and as a final finish. Process selection will depend on such factors as end effect desired, production layout of the plant and available equipment.

Equipment

The Schreiner calender generally consists of a two roll calendering device having an upper engraved heated steel roll and a lower smooth ground composition filled roll (Figure VIII). The top roll is approximately 12" in diameter of hollow construction allowing internal heating. Heat is generally supplied by gas fire. The engraving on the surface of the steel roll consists of fine diagonal lines in the frequency of 200 to 300 lines per inch.

The composition back-up roll (about 27" in diameter) can either consist of long staple cotton stock or normal Schreiner paper stock of 50% cotton and 50% wool. This roll is not heated but merely serves as a backup to create the necessary pressure to impose the engraving from the steel roll to the surface of the fabric. To prevent loss of width of tricot fabric in the Schreiner calendering operation it is necessary to feed the fabric to the nip at a minimum tension in the warpwise direction. To accomplish minimum tension and prevent nipping, the fabric is laced around an idler bar directly below the lower roll.

By use of the idler bar contact of the fabric is made with the lower roll at a point approximately 180° away from the nip. The fabric follows the surface of the lower roll through 180° thereby allowing flat tensionless delivery of the fabric to the nip. Slack batching is essential to prevent distortion of the calendered fabric. This technique was worked out by Harold B. Sturtevant of Du Pont's Technical Service Section. (Figure IX.)

Fig. VIII—Schreiner Calendering Machine
(Courtesy of John Verduin Machine Corp.)

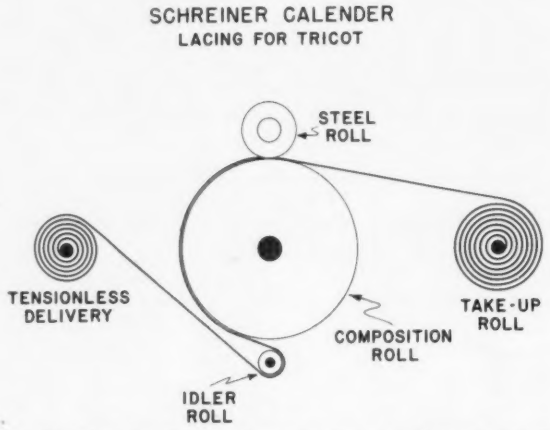


Fig. IX—Schematic diagram of calender thread up for nylon tricot.

Since the Schreiner calender has been used primarily in the finishing of broad woven cotton goods, machines wider than 72" have not been required and most machines are no wider than 48". Many of these machines are available for the processing of nylon tricot. This required special preparation of the goods to 48" width. Naturally this extra step will increase the cost of handling tricot. Several of the leading calender manufacturers have indicated their willingness to construct machines wide enough to accommodate full width tricot processing.

Schreiner calendering promises to be of value as a finishing technique for tricot made of other fibers. It also looks attractive for broadwoven fabrics made of nylon, Orlon acrylic fiber and Dacron polyester fiber. Blends of these fibers with wool and cellulosics also respond to Schreiner calendering where the synthetic is used in sufficient quantity to determine the characteristics of the fabric. In fabrics where complete "see through" coverage is not provided, calendering will increase the opacity. In these fabrics as well as those that have good "see through" cover a matte finish is imparted. In addition a marked change in handle occurs, suggestive of an up-graded construction. The application of this technique to broadwoven fabrics is a subject in itself and is being developed under a separate program.

The authors wish to acknowledge the helpful cooperation of Joseph Bancroft and Sons Co., Inc, and North Carolina Finishing Co. in connection with the development work leading to the preparation of this paper. ■

For the DYER and FINISHER

Two New Dyestuffs

General Dyestuff Co. has available a circular describing Indanthrene Grey GG Infra Double Paste, a new straight anthraquinone-type vat dyestuff manufactured for dyeing greenish-blue greys of generally excellent fastness properties on cellulosic fibers.

The company has also introduced Rapidogen, a stabilized azoic type black in powder form. It is said to meet the demand for economical blacks. A booklet describing this product has been prepared by the company.

Sequestering Agents

American Cyanamid Co. has published and is distributing its latest technical bulletin on dyes, "Sequestering Agents in Wool and Cotton Dyeing." The bulletin, No. 844, describes research in the use of sequestering agents and their applications. Copies may be obtained by writing the editors.

Matching Uniform Shades

A formula for matching the Government's standard M-107 khaki shade on 10-ounce tropical worsted in accordance with Military Specification JAN-C-391 has been issued by Sandoz Chemical Works, Inc. The shade is matched with the Omega Chrome series and other dyestuffs compatible with chrome colors. Copies of the bulletin, No. T-677 may be obtained by writing the editors.

New Dyes From Sandoz

Sandoz Chemical Works, Inc., has announced several new classes of dyes. Four new Lanasyn dyes have been added to the line of neutral premetallized dyes, and are recommended for dyeing of wool, silk or nylon. Diazamine Fast Scarlet 3GWL Pat. is reported as the latest fast-to-light diazo scarlet, and is suitable for discharge work by neutral and alkaline methods. A new antharaquinone brown, Sandothrene Red Brown N2RF Paste Ultrasperse, which yields shades fast to kier boiling and bleaching at minimum cost, also has been introduced by the company.

Berkshire Color Plant

Full-scale production is now under way at Berkshire Color & Chemical Co.'s new plant in Reading, Pa. The plant, formerly occupied by the Bick Chemical Corp., has been renovated and modernized with the latest equipment for the manufacture of quality dyestuffs.

For further information write the editors

New Modifying Resin

Mona Industries, Inc., Paterson, N. J., has added a new hand modifying resin, Monabond, to its line of textile chemicals. The addition of Monabond to the present resin formulation is said to result in a reduction of residual shrinkage and improved flat abrasion resistance besides enhancing the durability of the resin finish to washing or dry cleaning. It also gives added bulk, weight and fullness to the finished fabric.

Naphthol AS-LG Source

Blackman-Uhler Co. and Alliance Color & Chemical Co. divisions of The Andover Co., have added Naphthol AS-LG to their line of fast color specialties, opening up a new domestic source. Naphthol AS-LG, a substantive naphthol, produces shades from bright yellow to cordovan on cotton and rayon.

New Pesticide Finish

New compounds which possess water repellant properties of conventional silicones and fungicidal and pesticidal properties of arsenicals have been synthesized in the Central Research Laboratories of American Smelting and Refining Co. and E. F. Houghton & Co.

Known as arsenosiloxanes, the compounds are believed to have particular value for use in damp locations. Electrical insulations, canvas enclosures and leather products are a few of the materials which might well be protected from moisture and insect attack by the compounds.

New Aluminum Salt

A new aluminum salt, Trinoral, for use in the preparation of water repellant compounds for textiles, has been introduced by Rhodia, Inc. The new product, aluminum triformate, can advantageously replace aluminum diformate, aluminum acetate, etc., in the preparation of water repellant compounds, according to Rhodia. Purity of Trinoral is said to make it very stable in compounding. Since it does not require addition of acetic acid, it is economical and efficient.

Dyes for Acrilan, Orlon

Difficulties originally experienced in dyeing Orlon and Acrilan virtually have been overcome by recent developments in this field, according to Ciba Co., Inc. Helpful in this connection is the recent expansion of Ciba's Deorlene series of basic dyes to include three new colors: Brilliant Yellow 5GL, Brilliant Red R, and Blue BR. The new Deorlenes are said to be suited to dyeing clean, lively shades on Orlon and Acrilan.

For further information write the editors

Anti-Static Agents Offered

Elosol, anti-static agent, is available in three types from Sandoz Chemical Works, Inc. Each type is suitable for application to synthetic fibers in loose, yarn, and piece goods form. Elosol SG and Elosol UW act as softening agents, while Elosol V has no noticeable effect on the hand of the goods. Graphs illustrating the relative anti-static effects of the three are published in a booklet available from the company.

New Cobalt Dyes Patented

U. S. patents were granted recently for an entirely new class of cobalt compounds for dyeing textiles developed by two Germans, Fritz Baumann and Berthold Bienert. They state that the new dyes can be used for printing textiles also. According to the inventors, one advantage of using the cobalt compounds is that the cobalt phtalocyanines can be prepared directly on the fibers to be dyed because the reactions proceed at lower temperatures than previously possible.

The chemicals are obtained by reacting a cobalt salt and urea and such compounds as phtalic anhydride in the presence of ammonium molybdate as a catalyst at temperatures of 330 degrees F. The reaction is stopped when the yellow to brown-red solid is formed. The inventors assigned their patent, No. 2,768,867, to Farbenfabriken Bayer, Leverkusen, Germany.

Dyestuff Price Increase

American Cyanamid Co. has increased dye prices 18% on most of its dyes. A company spokesman said the increase was necessary to meet constantly rising costs of raw materials, labor, and research and technical services.

Booklet on Guar Gum

Stein Hall & Co., Inc., has available upon request, a 16-page booklet describing guar gum, the new natural vegetable colloid. The booklet, entitled Jaguar, includes such information as the handling of the product, types available, applications, and food and drug standards concerning guar gum.

Acrylic Monomer Bulletin

A technical bulletin on dimethylaminoethyl methacrylate, now available in pilot plant quantities, is available on request to Rohm & Haas Co., Washington Square, Philadelphia, Pa. In addition to listing physical properties, toxicity, presence of an inhibitor, polymerization and quaternization of the monomer, the bulletin also describes copolymerization processes and applications.

For further information write the editors

U. S. MAN-MADE FIBER PRICES

This schedule lists the prices of yarns, staple and tow as reported by the producers in November, 1956. All prices are given as subject to change without notice.

RAYON FILAMENT YARN

American Bemberg

Current Prices

Regular Production Reel Spun Yarn

Den/Fil	No Twist Skeins	Twisted* Skeins & Cones	8½ Turns	High Twist Skeins & Cones 12 Turns	15 Turns	18 Turns
40/30	$1.49	$1.95	....	....	....	$2.08
50/36	1.24	1.50	....	....	....	1.72
65/45	1.14	1.30	....	$1.53	....	1.58
75/60**	1.04	1.18	....	1.41	$1.46	1.49
100/74**	.95	1.08	....	1.33	1.38	1.44
125/60	.94	1.05	$1.09	1.30	....	....
150/120	.93	1.02	1.12	1.27	....	....
300/225	....	.95	....	....	1.08	....

* Twist includes twists up to 6 turns on 40 and 50 denier, and up to 5 turns on heavier deniers.
** Spun Dyed Cupracolor Black 15¢ per lb. extra.

"44" HH Spool Spun Yarn

Den/Fil	No Twist Tubes	No Twist Beams	5 Turn Beams	5 Turn Cones	12 Turn Beams	12 Turn Cones	15 Turn Cones
40/30	$1.35	$1.35	....	....	....	....	....
50/36	1.00	1.00	....	....	....	....	....
65/45	1.05	....	....	....	....	$1.42	....
75/45*	.97	....	$1.08	$1.08	$1.31	1.31	$1.39
100/60*	.89	....	1.03	1.03	1.23	1.23	1.31
125/60	.84	....	.99	.99	....	....	....
150/90*	.77	....	.81	.81	1.50	1.15	1.24
150/120	.81	....	....	.93	....	....	....

* Available also in Spun Dyed Cupracolor Black at 15¢ per lb. extra.

Nub-Lite (Short Nubbi)

Code	Den/Fil	2½ Twist Skeins	2½ Twist Cones*	5 Twist Skeins	5 Twist Cones*
1516	150/90	....	....	$1.45	$1.35
1517**	150/90	....	....	1.45	1.35
2000	200/120	....	....	1.06	.96
2025***	200/120	....	....	1.06	.96
3000	300/180	$1.10	$1.00	....	....
4000	400/224	1.10	1.00	....	....
6000	600/360	1.08	.98	....	....
8000	860/450	1.08	.98	....	....

* Basic price for cones when dyed. Dyed Colors 30 and 35 cents above basic price. Prices based on 200 lb. dyed lots only. Prices for natural yarn on cones same as skein prices.
** Code 1517 can be run in warp or filling.
*** Code 2025—Softer than 2000.

CUPIONI Type B

Code	Den/Fil	No Twist Skeins	2½ Twist Cones	5 Twist Cones
9600	50/30	$1.39	....	$2.14
9640	70/45	1.29	$1.64	....
9656	100/60	....	1.48	....
1540	150/90	....	1.25	....
9710	200/120	....	1.20	....
9734	275/135	....	1.10	....
9790	450/225	....	1.10	....
9813	600/372	....	1.07	....

Spun Dyed Cupracolor Black 35¢ per lb. extra. This applies to all deniers.

Long Type A

Code	Den/Fil	2½ Twist Cones	5 Twist Cones
9686	150/135	$1.20	$1.25
9738	275/135	1.05	1.10
9780	450/372	1.05	1.10
9815	600/372	1.02	1.07
9826	900/372	.95	1.00
9876	1250/372	.95	1.00
9925	2500/744	.95	1.00

Modified Type C

Code	Den/Fil	5 Twist Cones
9662	100/60	$1.43
9688	150/120	1.25

Terms: Net 30 days, F. O. B. shipping point. Minimum freight allowed to consignee's nearest freight station east of the Mississippi River. To points west of the Mississippi River minimum freight allowed to Memphis, Tennessee. Goods after shipment shall be at buyer's risk. Merchandise transported in seller's own trucks or those of its affiliates is sold F. O. B. delivery point.

American Enka Corp.

Current Prices
Effective December 4, 1956
Standard Quality Yarns

Standard Quality Rayon Yarns

A. Natural

Den./Fil.	Luster	Turns	Skeins: Weaving Cones	Beams	Long	Short	Cakes	Knitting Cones
50/18	E	5 S						1.56
75/10	B	3 S&Z					1.08	
75/18	E	4 S						1.22
75/30	B	2.5,4S&Z	1.17	1.17			1.08	1.17
75/30	B	8 S	1.22			1.37		1.22
75/45	P,E	2.5, 4,5S&Z	1.17	1.17	1.23	1.37	1.08	1.17
75/60	B,P	3,4 Z	1.22				1.10	1.22
100/14	B,P	3 S&Z				1.12	.96	
100/40	B,E	12 S						1.27
100/40	B,P,E	4,5 S&Z					.96	1.04
100/40	B	6 S	1.10					
100/40,60	B,P	2.5,4S&Z	1.04	1.04	1.08	1.12	.96	1.04
100/60	E	2.5 S	1.06	1.06			.98	
125/40	E	3 Z						.96
150/40	B,P,E	2.1,3S&Z	.91	.91	.94	.99	.86	.90
150/40	B,E	5 S&Z	.91		.94	.99	.86	
150/40	B,E	8 S&Z	.97		1.00	1.05		
150/40	B,P	10 S&Z	1.03	1.03				
150/90	B,E	2.1 S&Z	.92	.92			.87	
200/40	P	3 Z						.82
200/40	B,P	8 S				.95		
250/60	P,E	2.4 Z						.75
300/50	B,E	3 S	.73	.73				
300/60,120	B,P,E	2.1 S&Z	.73	.73		.76	.71	.73
300/60	B	3.5 S	.73	.73		.76	.71	
300/60	B	4.3 S	.76	.76			.74	
300/60	B	7 S	.83					
300/40,120 H.T.	B	2.5, 3,4S	.75	.75				
450/80	B	3 S	.70	.70		.72	.68	
600/80,120	B,E	3 S	.69	.69			.67	
900/120	B	3.4 S	.68				.66	
900/120 H.T.	B	3.6 S	.70				.68	

"Jetspun" Colored Yarns

Den./Fil.	Tenacity	Turns	Weaving Cones	Beams*	Cakes	Colors
100/40	Regular	2.5S	1.39	1.39		All
150/40	Regular	2.1S	1.26	1.26		All
200/40	Regular	8.3S	1.27			All
450/80	Regular	3.0S	1.05			All
300/40	High	3.4S	1.10	1.10		All
600/80	High	3.4S	1.06			All
900/120	High	3.4S	1.05	1.05		All

Registered trade mark of American Enka solution dyed rayon yarn.
* Single color.

American Viscose Corp.

Effective December 14, 1956

Graded Yarns

Denier	Filament	Type	Short Skeins	Long Skeins	All Cones Beams Tubes	Cakes
50	20	Bright & Dull	$	$1.59	$1.56	$1.45
60	10	Bright	....	....	1.41	1.30
75	10-30	Bright	1.24	1.20	1.17	1.08
75	30	Dull	....	....	1.17	1.08
100	14-40	Bright	1.12	1.07	1.04	.96
100	60	Dull	....	....	1.06	.98
150	24-40-60	Bright & Semi-Dull	.99	.94	.91	.86
150	40	Dull	....	....	.91	.86
150	90	Dull	....	....	.92	.87
200	10-44	Bright	.90	.85	.82	.78
250	60	Semi-Dull & Dull	.82	.78	.75	.73
300	44	Bright & Dull	.79	.76	.73	.71
300	234	Dull	....	....	.75	.73
450	100	Bright	....	.72	.70	.68
600	100	Bright	....	.71	.69	.67
900	60-100-150	Bright	....	.70	.68	.66
1200	75	Bright	....	.67	.65	....
2700	150	Bright	....	.70	.68	....

Extra Turns Per Inch

75	30	Bright 6-Turns	$1.36	$1.32	$1.29	$ ....
100	40	Bright 6-Turns	1.24	1.19	1.16	1.08
150	40	Bright 6-Turns	1.09	1.04	1.01	.96
300	15	Bright 5-Turns	....	....	.78	....
300	44	Bright 6-Turns	....	.86	.83	.81
600	30	Bright 5-Turns	....	.76	.74	.72

Rayflex Yarns

150	60	Rayflex	$	$	$ .94	$ .89
300	120	Rayflex	....	....	.75	.73
450	120	Rayflex	....	....	.72	.70
600	234	Rayflex	....	....	.71	.69
900	350	Rayflex	....	.72	.70	.68

Textile News Briefs

Recruitment Program

American Viscose Corp. is making available to prospective college graduates a 24-page booklet, "American Viscose Corporation—Research and Development," as part of its recruitment program. The brochure No. 3223, is especially aimed at those students majoring in chemistry, physics, engineering and mathematics. Copies may be obtained from the Recruitment Director, American Viscose Corp., 1617 Pennsylvania Blvd., Philadelphia 3, Pa.

Aldon Rug Wins Award

The National Institute of Rug Cleaning Seal of Cleanability was presented in early January to Aldon Rug Mills. The Seal of Cleanability certificates presented to 101 styles and colors of carpeting produced by Aldon attest they are the first selection of rugs and carpets to measure up to the Institute's cleanability testing requirements. The carpeting presented with certificates underwent extensive testing by the Institute.

New Colored Carpet Staple

American Viscose Corp. has started commercial production of Colorspun (solution dyed) carpet rayon staple. Deliveries were started in January from the firm's Parkersburg, W. Va., plant. The staple, offered in colors designed for blending and also acceptable for tweed combinations, is being made in 15 denier initially. Prices range from 45 to 55 cents per pound.

Roberts Adds New Building

Roberts Co. is putting up a Butler prefabricated building at one of its plants in Sanford, N. C., for handling steel and other metals used by the company in manufacturing components for its textile spinning frames. The new building, which will have 6,000 square feet of space, has a reinforced concrete floor designed to carry exceptional storage weights and permit the use of heavy presses for cutting operations.

Urethane Interlining Boom

More than 1,000,000 square yards of urethane foam will be used this year as interlining in outerwear garments, according to Peter Oppenheimer of Brand & Oppenheimer, Inc., New York converters. He estimates that upwards of 15,000,000 square yards will be used annually within three years. Oppenheimer said the new chemical foam already has proved its ability as an insulating material.

Avisco Cellophane Output Up

American Viscose Corp. reports its cellophane sales and production set all-time highs in 1956, surpassing the previous record established in 1955. About 75% of domestic cellophane output is used for food packaging, according to H. J. Michel, general manager of Avisco's Film Division. The remaining 25% is used to package a wide variety of hard and soft products, including drugs. Production at the firm's Marcus Hook, Pa., plant, converted last year to cellophane, is expected to begin late in 1957. When operations are fully under way, Avisco will be producing over 150 million pounds of cellophane annually.

Parks-Cramer Bulletins

Parks-Cramer Co. has available a new series of bulletins on floor sweeper and lint removal; traveling room cleaners for card rooms; controlled air currents; loom cleaning; traveling cleaners for spinning rooms and SpinSaVac for the spinning frame. Available soon will be four more bulletins on air conditioning.

Thick and Thin Yarns

150	40-90	Bright & Dull	$	$	$1.15	$ ....
200	75	Bright & Dull	....	....	1.05	....
300	120	Bright & Dull	....	....	.95	....
450	100	Bright & Dull	....	....	.92	....
490	120	Bright & Dull	....	....	.95	....
900	350	Dull	....	....	1.00	....
920	120	Bright & Dull	....	....	1.00	....

Colorspun Yarns

Currently producing regular and high tenacity at premiums at $.35 per pound.

Viscose Filament Yarns

The following material deposit charges are required:

Metal Section Beams	$170.00 each
Wooden Section Beams	55.00 each
Wooden Section Beam Crates	30.00 each
Metal Section Beam Racks	75.00 each
Metal Tricot Spools—14" flange	30.00 each
21" flange	60.00 each
32" flange	150.00 each
Metal Tricot Spool Racks—14" flange	135.00 each
21" flange	100.00 each
32" flange	75.00 each
Wooden Tricot Spool Crates	20.00 each
Cloth Cake Covers	.05 each

Same to be credited upon return in good condition—freight collect.
Terms: Net 30 days.

Celanese Corp. of America

Current Prices
Effective December 14, 1956

Den.	Fil.	Twist		Beams	Cones	Cakes	Non Shrunk Tubes
#49 and #14 Production							
75/30/3	Bright			....	$1.11	$1.03	....
100/40/2Z	"			$.96	....	....	....
100/40/3	"			.98	.96	.91	....
100/40/5	"			....	1.02	.97	....
100/60/3	"			....	.97	.92	....
125/40/2Z	"			.94	.92	....	....
150/40/3	"			.89	.85	.80	....
150/40/2Z	"			.87	....	....	....
150/40/5	"			....	.91	.86	....
150/40/8	"			....	.97	.92	....
150/40/0	"	NS		....	.71	....	....
300/50/3	"			.72	.71	.69	....
300/50/0	"	NS		....	.63	....	....
#20 Production							
150/40/3	Bright			.87	.83	.78	....
150/40/0	"	NS		....	.71	....	....
150/40/2Z	"			.87	....	....	....
300/50/3	"			.72	.71	.69	....
300/50/0	"	NS		....	.63	....	....
#20 Production							
100/40/3	Dull			....	.96	.91	....
100/66/2Z	"			1.00	....	....	....
100/60/0	"			....	.93	....	....
100/60/5	"			1.04	1.02	.97	....
150/40/3	"			.87	.83	.78	$.77
150/40/0	"	NS		....	.71	....	....
150/90/3	"			....	.90	.85	....
250/60/0	"	NS		....	.67	....	....
250/60/3	"			....	.75	....	.70
#52 Thick & Thin Rayon							
150/60/3	Bright			....	1.15	....	....
450/120/3	"			....	.89	....	....

Terms: Net 30 days. Prices per pound F.O.B. shipping point, lowest transportation allowed to destination in U.S.A. east of the Mississippi River.
Prices subject to change without notice.
All previous prices withdrawn.
Note: Prices on unlisted items can be obtained upon request.

E. I. du Pont de Nemours & Co.

Textile Fibers Dept.
Current Prices
Effective with orders December 7, 1956

Bright and Dull

Den.	Fil.	Turns/ Inch Up to		(A) Cones, Beams, Tubes	Skeins	Cakes
40	20	3	Textile "Cordura"*	$1.90	$1.90	$1.85
50	20	3		1.63	1.63	
50	20	3	Textile "Cordura"	1.65	1.65	1.60
50	35	3	Textile "Cordura"	1.70	1.70	1.65
75	10	3		1.17	1.20	1.08
75	15	3		1.17	1.20	1.08
75	30	3		1.17	1.20	1.08
100	15	3		1.04	1.07	.96
100	40	3		1.04	1.07	.96
100	60	3	Bright	1.04	1.07	.96
100	60	3	Dull	1.06	1.09	.98
125	50	3		.96	.98	.90
150	40	3		.91	.92	.86
150	60	3		.91		
150	60	3	Textile "Cordura"	.92	.93	.87
150	90	3	Dull	.92	.93	.87
150	100	3	Dull	.92	.93	.87
200	35	3		.82	.84	.78
300	20	3		.73	.76	.71
300	50	3.5		.73	.76	.71
300	120	3	Textile "Cordura"	.74	.77	.72
450	72	3		.70	.72	.68
600	96	3		.69	.71	.67
600	240	3	Textile "Cordura"	.70	.72	.68
900	50	3		.68	.71	.66
900	144	3		.68	.70	.66
1165	480	3	Textile "Cordura"	.68	.68	.65
1800	100	3		.68		
2700	150	3		.68	.70	
5400	300	3		.75		

Thick and Thin

100	40	3	#7	1.38		1.38
150	90	3	#7	1.15	1.16	1.15
150	90	3	#19	1.15	1.16	1.15
200	80	3	#7	1.05	1.06	1.05
200	90	3	#19	1.05	1.06	1.05
450	100	3	#7	.89	.90	.89
1100	240	3	#50	1.32		1.32
2200	480	3	#50	1.14		1.14

Fiber E

300	50	2½	.88
900	50	2½	.83
900	90	2½	.83
2700	150	2½	.88
2700	270	2½	.88
5400	540	2½	.88

(A) 2¢/lb. additional for cones less than 3# and tubes less than 2#.
Terms: Net 30 days.
Domestic Freight Terms are F.O.B. shipping point, freight prepaid our route to points east of the Mississippi River within the continental limits of the United States, for points west of the Mississippi River freight allowed to the Mississippi River crossing nearest purchaser's mill if shipped overland, or port of exit of purchaser's choice east of Mississippi River.
* "CORDURA" and "SUPER CORDURA" are DuPont's registered trade-marks for its high tenacity rayon yarn.

Industrial Rayon Corp.

Effective December 21, 1956

Denier	Filament	Turns per In.	Type	2.8 Lb Cones	4.4 Lb Cones	Beams	2.2 Lb Tubes	4.4 Lb Tubes
100	40	2.5 "S"	Bright	1.04		1.04		
150	40	2.5 "S"	Bright	.91		.91		
150	40	2.5 "S"	Luster #4	.91		.91		
150	40	2.5 "S"	Bright intermediate strength	.92				
200	20	2.5 "S"	Bright	.82				
200	40	2.5 "S"	Bright	.82				
300	44	2.5 "S"	Bright	.73		.73		
300	80	2.5 "S"	Bright	.73		.73		
300	80	2.5 "S"	Luster #4	.73		.73		
300	80	2.5 "S"	Bright extra strong	.75		.75		
450	60	2.0 "S"	Bright		.70	.70		
600	90	1.5 "S"	Bright		.69	.69	.69	.69
900	50	2.0 "S"	Bright		.68	.68	.68	.68
900	150	1.5 "S"	Bright		.68	.68	.68	.68

Luster #4 is semi-dull.
Terms: Net 30 days f.o.b. point of shipment; title to pass to buyer on delivery of goods to carrier. Domestic transportation charges prepaid with transportation at lowest published rate to all points east of the Mississippi River. PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

North American Rayon Corp.

Current Prices

First Quality Yarns	Den/Fil	Twist	Cones: Knitting* Cones	Cones: No Twist Knitting Cones	Cones: Beams, Tubes** and Weaving Cones	Untreated Cakes
	75/30	3.5			$1.17	$1.08
	75/30	7			1.30	
	75/30	15			1.37	
Normal	75/30	20			1.40	
Strength Yarns	100/40/60 Brt.	3.5			1.04	.96
NARCO	100/40/60	12			1.22	
	125/52/60	3			.96	.90
	125/52	10			1.13	
	150/42/60/75	3	$.90		.91	.86
	150/42	0		$.71		
	300/75	3	.73		.73	
	300/75	0		.63		
	300/75	6			.83	
	600/98	3	.69		.69	
	900/46	2.5	.68		.68	
	1800/92	2.5	.68		.68	
Semi-High	300/75 Brt.	6			$.84	
Strength Yarns	300/75	3			.74	
Hi-NARCO						

* Oiled Cones $.01 Per Pound extra for Graded Yarns only.
** 1 lb. tubes $.02 Per Pound extra for Graded Yarns only.
Terms: Net 30 days, F.O.B. shipping point, minimum freight allowed to consignee's nearest freight station east of the Mississippi River. To points west of the Mississippi River minimum freight to Memphis, Tennessee allowed. Goods after shipment shall be at buyer's risk. Merchandise transported in seller's own trucks or those of its affiliates is sold F.O.B. delivery point.
Prices subject to change without notice.

RAYON HIGH TENACITY YARN and FABRIC

American Enka Corp.

Effective November 1, 1956

Tempra (High Tenacity)

Denier	Elongation	Beams & Cones
1100/480	Low	.59
1230/480	High	.59
1650/720	Low	.55
1820/720	High	.55
2200/960	High & Low	.55

Suprenka (Extra High Tenacity)

1650/720	Low	.58
1900/720	High	.58
2200/960	Low	.57

* Beams Only.
Terms: Net 30 days, f.o.b. Enka, North Carolina, or Lowland Tennessee; minimum freight allowed to first destination east of the Mississippi River.

Chemnyle Process

(Continued from Page 71)

1. Streakiness normally associated with dyestuffs other than disperse types has been virtually eliminated in many cases and reduced to an acceptable minimum in others.

2. Good washfastness has been obtained at 120°-140°F on the basis of a normal dyeing which can be boosted to 160°F by aftertreatments. Many chrome dyestuffs yield excellent washfastness at 160°F.

3. Lightfastness is that normally associated with acid and direct dyestuffs on nylon and ranges between 15-80 hours. Selected chrome dyestuffs give lightfastness ranging from 40-80 hours, depending upon shade.

4. Shades of a brilliance not normally associated with filament nylon may be obtained.

5. The hand and touch of goods dyed by the Chemnyle process is of a softer fuller and more rounded nature than by normal methods.

The Chemnyle method of dyeing is of an extremely simple nature and requires no profound technical knowledge for its application. The filament nylon goods, in whatever form they maye be, are prepared conventionally. They are then treated for a period of 10 minutes in from 2-3% Chemnyle dyeing assistant,

(Continued on Page 91)

Newsbriefs

New Rub Apron Fabric

Dayton Rubber Co. has developed a new rubber product to help textile mills produce more uniform yarns with less power consumption. Known as a rub apron, the device has a permanently rough surface for rubbing thin fibers into yarn. The fabric was developed with an improved compound which will resist any oils that may be applied to the fibers. The apron is said to be effective either on wet or dry runs. It "tracks" uniformly over the entire surface, and is reported not to slick up or oxidize. *For further information, write the editors.*

Heresite Issues Catalog

Heresite & Chemical Co., Manitowoc, Wis., has issued a catalog which contains data and information concerning Heresite Hep-22, a pure phenolic coating. The catalog presents a comprehensive view of the variety of industrial parts which can be coated to protect them from all kinds of corrosive action. For free copies write the company at the above address for catalog No. 57.

Atlas Textile Center

Atlas Powder Co. on January 17 broke ground for a $3,000,000 Technical Center near Wilmington, Del., to enable the company to intensify its technical service to the textile industry. The center will provide extensive facilities for work across the entire range of applications served by Atlas products, including sorbitol, emulsifiers, detergents, polyester resins, activated carbons and explosives.

Personnel Changes

Dr. Joseph B. Quig, internationally recognized authority on textile fibers, has retired from his post as a research manager in the Textile Research Division of Du Pont's Textile Fibers Department. He joined the company in 1926 as a technical assistant in rayon manufacture at its Old Hickory, Tenn., plant.

American Viscose Corp.

Effective November 1, 1956
Revised November 14, 1956

Super Rayflex

Denier	Filament	Twist	Beams	Cones
1100	490	0	$.63	$.63
1100	490	4.1Z	.63	...
1650	980	0	.58	.58
1650	980	4.1Z	.58	...
2200	980	0	.57	.57

Tire Yarn

1100	490	2.5Z	.59	...
1650	980	0	.55	.55
1650	980	3.2Z-3.6Z	.55	...
2200	980	0	.55	.55

High Strength

1150	490	2.5Z	.59	.59
1230	490	3.6Z	.59	.59
1650	980	3.5Z	.55	.55
1875	980	3.6Z	.55	.55

Super Rayflex, Tire Yarn and High Strength yarns are sold "Not Guaranteed for Dyeing."

Tire Fabric

	Tire Yarn	Super Rayflex
1100/490/2	$.69	$.73
2200/980/2	.635	.655

Above prices based on 80% minimum Carcass, 15% maximum Top Ply, 5% maximum Breaker.

1650/980/2

* Production Factor

525	Open	Carcass	$.635	$.665
300	490	Top Ply	.645	.675
115	275**	Breaker	.67	.70

* Determined by dividing total ends by picks.

** Orders limited to 5% of total 1650 Fabric booked for any given period.

The following deposit charges are made on invoices:

Beams	$55.00 each
Crates (Metal)	75.00 each
Fabric Shell Rolls	3.50 each

Same to be credited upon return in good condition—freight collect
Terms: Net 30 days.

Celanese Corporation of America

Effective December 27, 1955
Supersedes September 12, 1955

Fortisan Yarn Prices

Denier	Packages	Natural	Black
30/2.5/40	2 lb. Cones	$3.00 lb.	$3.35 lb.
60/2.5/80	4 " "	2.40 "	2.75 "
90/2.5/120	4 " "	2.25 "	2.60 "
120/2.5/160	4 " "	2.05 "	2.40 "
150/2.5/180	4 " "	1.95 "	2.30 "
270/2.5/360	4 " "	1.85 "	2.20 "
300/2.5/360	4 " "	1.85 "	2.20 "
60/2.5/80 Olive Green—Spun Dyed—OG106		4 lb. Cones	3.50 lb.

Terms: Net 30 days. Prices per pound F.O.B. shipping point, lowest transportation allowed to destination in U. S. A. east of the Mississippi River.

Prices subject to change without notice.
All previous prices withdrawn.
Note: Prices on unlisted items can be obtained upon request.

Fortisan-36 Rayon Yarn
Bright

Denier and Filament	Twist	4# cones	8# cones	Tubes	Beams
270/280	0.8Z	$2.30			
300/280	0.8Z	$2.05			
400/400	0.8Z	$1.75			$1.70
400/400	0			$1.75	
800/800	0.8Z	$1.25	$1.25		$1.20
800/800	0			$1.25	
1600/1600	0.8Z	$1.15	$1.15		$1.10
1600/1600	0			$1.15	

Terms: Net 30 days. Shipments prepaid to any destination in U. S. A. East of the Mississippi River. Shipments West of the Mississippi will be made on a collect freight basis and allowance will be made for the lowest transportation cost to the point of river crossing.

Prices subject to change without notice.
All previous prices withdrawn.
Note: Prices on unlisted items can be obtained upon request.

E. I. du Pont de Nemours & Co.

Textile Fibers Dept.
Current Prices
Effective with shipments October 29, 1956

"Super Cordura"*
(all packages)

1100	480	2	$.63
1250	480	2	.63
1650	720	2	.58
1900	720	2	.58
2200	960	2	.57
2450	960	2	.57

Beams containing ends of direct dyed yarn $3.30 per end extra.
Terms: Net 30 days.

Domestic Freight Terms are F.O.B. shipping point, freight prepaid our route to points east of the Mississippi River within the continental limits of the United States, for points west of the Mississippi River freight allowed to the Mississippi River crossing nearest purchaser's mill if shipped overland, or port of exit of purchaser's choice east of Mississippi River.

* "CORDURA" and "SUPER CORDURA" are DuPont's registered trade-marks for its high tenacity rayon yarn.

Industrial Rayon Corp.

Effective November 1, 1956

Unbleached Bright High Tenacity Yarns

SINGLE END BEAMS AND CONES:

Den.	Fil.	Turns Per In.	4.4 Lb. Cones	Beams	2.2 Lb. Tubes	4.4 Lb. Tubes
1100	480	1.5 "Z"	.59	.59	.59	.59
1650	720	1.5 "Z"	.55		.55	.55
2200	1000	1.5 "Z"	.54	.54	.54	.54
3300	1440	1.5 "Z"	.54	.54	.54	.54
4400	2000	1.5 "Z"	.54	.54	.54	.54

"Above Prices apply to Type 100. Type 200 Tyron Prices are 3¢ more."

Terms: Net 30 days f.o.b. point of shipment; title to pass to buyer on delivery of goods to carrier. Domestic transportation charges allowed at lowest published rate to all points east of the Mississippi River.

Prices are subject to change without notice.

North American Rayon Corp.

High-Strength Yarns—SUPER-NARCO		Twist	Cones	Beams
1650	720	3Z		$.55
1850	720	3Z	$.55	
Super High Strength Yarns—				
1650	720	1.5Z	.58	.58

Terms: Net 30 days, f.o.b. shipping point. Minimum freight allowed to consignee's nearest freight station East of the Mississippi River. To points West of the Mississippi River minimum freight to Memphis, Tenn. allowed. Goods after shipment shall be at buyer's risk. Merchandise transported in seller's own trucks or those of its affiliates if sold f.o.b delivery point.

ACETATE FILAMENT YARN

American Viscose Corp.

Current Prices
Effective December 21, 1956

Bright and Dull

* Intermediate Twist

Denier & Filaments	Cones & 4-6 Lb. Tubes	Twister Tubes	Warps	Spinning Cones	Twist Warps
55/14	$1.04	$1.02	$1.05	$.98	$.99
75/20	1.00	.98	1.01	.94	.95
100/28	.95	.93	.96	.89	.90
120/32	.86	.84	.87	.80	.81
150/41	.77	.76	.78	.72	.73
200/54	.73	.72	.74	.69	.70
300/80	.69	.68	.70	.65	.66

* Standard Twist 2¢ additional.
Terms: net 30 days.

Celanese Corp. of America

Current Prices
Effective December 20, 1956

Bright and Dull

Denier and Filaments	Intermediate Twist 4 & 6-Lb Cones	Beams	4 & 6-TM Tubes	Spinning Twist 4-Pound Cheeses	Cones	Beams	O Twist Tubes
45/13	$1.17	$1.18	$	$	$	$1.12	$ ....
55/15	1.04	1.05	....	....	.98	.99	.925
75/20	1.00	1.01	.98	....	.94	.95	.84
75/50	1.02	1.03	1.00	....	....	....	.89
100/26-40	.95	.96	.93	....	.89	.90	.81
120/40	.86	.87	.85	....	.80	.81	....
150/40	.77	.78	.77	.77	.72	.73	.69
200/52	.73	.74	.73	....	.69	.70	....
300/80	.69	.70	.69	....	.65	.66	.63
450/120	.67	.68	.67	....	.63	.64	....
600/160	.65	.66	.65	....	....	....	....
900/80-240	.63	.64	.63	....	....	....	.61

150 Denier 12-TM Tubes	.76
55/0/15 Dull Tricot Beams	.985
2-Pound Cheeses	.01 Less Than 4-Pound Cheeses
2-BU and 4-Bu Tubes	Same Price as 4 and 6-Lb. Cones
2-Lb. Twist Tubes	.01 Less Than 4 & 6-Lb. Twist Tubes on 120, 200 and 300 Denier Intermediate Twist

Terms: Net 30 days. Prices per pound F.O.B. shipping point, lowest transportation allowed to destination in U.S.A. east of the Mississippi River.

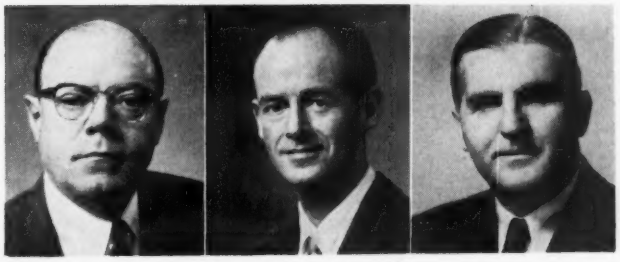
Prices subject to change without notice.
All previous prices withdrawn.
Note: Prices on unlisted items can be obtained upon request.

Celaperm Filament Yarn Prices

Denier and Filaments	Intermediate Twist 4 & 6-Lb. Cones	Beams	Spinning Twist Cones	Beams
55/15	$1.37	$1.38	$1.31	$1.32
75/20	1.34	1.35	1.28	1.29
100/26	1.28	1.29	1.22	1.23
120/40	1.19	1.20	1.13	1.14
150/40	1.11	1.12	1.06	1.07
200/52	1.05	1.06	1.01	1.02
300/80	1.01	1.02	.97	.98
450/120	.99	1.00	.95	.96
600/160	.97	.98	....	....
900/80	.94	....	....	....

3 to 5 Turns on Cones or Beams — $.02 Additional

Effective March 11, 1955



Left to right:

J. P. Holmes

R. T. Mann

J. H. Black

John P. Holmes has been appointed president of Celanese International Corp., Amcel Co., Inc., and Pan Amcel Co., Inc., all subsidiaries of Celanese Corp. of America. He will retain his position as vice president of the parent company. **Robert T. Mann** has been appointed assistant textile merchandising manager of Celanese and **James H. Black** assumes the position of controller, succeeding **Arthur R. Janes.**

In the same company **Peter D. Cooper** has retired from his post as vice president and director.

Wm. T. Cummins

William T. Cummins has been appointed district sales manager for Eastman Chemical Products, Inc., textile division, covering the New York territory. In the same company **J. Vernon Kirkman** has been appointed assistant manager, sales service department; **Edgar P. Moore,** sales service representative for the Greensboro territory; **Donald G. Pihl,** sales service representative for the New England territory.

Kenneth N. Bacon has been appointed advertising and sales promotion manager of American Enka Corp., succeeding **William M. Pomeroy, Jr.** who has joined the company's industrial sales department. **H. Frank McKee** has joined the South Atlantic district sales staff.

R. L. Huffines, Jr. has become chairman of the board of the recently formed southern division of Frank G. Binswanger, Inc. Mr. Binswanger will serve as president of this division.

Robert B. Lautner has been named manager of the Moundsville, W. Va., chlorine-caustic soda plant of Solvay Process Division, Allied Chemical & Dye Corp., succeeding **W. E. Dugan, Jr.** deceased.

In the National Aniline Division, **William J. Urbowicz** has been named product manager of Alicyclic chemicals. Other staff changes include the appointment of **William H. Metzger** regional representative in charge of Caprolan polyamide fiber sales in the Pennsylvania, New York, and New England area; **William H. Poisson,** technical assistant; **George B. Monk** representative-at-large to handle special sales assignments; **Daniel J. Bruce,** market development supervisor; **Elsa Wells,** assistant office manager.

Henry A. Weil has been appointed associate director of the New York application research laboratories of Sandoz Chemical Works, Inc.

Roy S. Fisher has been elected vice president and director of sales for National Vulcanized Fibre Co.

John A. Heywood has been appointed Brazilian representative for Draper Corp.

Raymond L. Hildebrand has been appointed staff assistant in American Viscose Corp.'s Industrial Relations Department. The company has named **Dr. Francis M. Parker** for the newly created position of director of marketing. **Charles W. Davies** has been transferred to the New York office and will concern himself with the development of tire yarn.

Alyce Furlonge has joined Textured Yarn Co., Inc. as retail fashion promotion coordinator and will promote Tycora yarns.

L. W. Newton has been appointed assistant to the vice president of research at Carbide and Carbon Chemicals Co., division of Union Carbide and Carbon Corporation.

Robert G. McKaig has retired from his post with Whitin Machine Works as assistant secretary and manager of the repair sales office. His retirement terminates 49 years of service with the company.

Deaths

Edwin J. Loewy, secretary-treasurer of the Textile Distributors Institute and a vice president of United Merchants and Manufacturers, Inc. has died of a heart attack at the age of 63.

Celaperm Black Yarn Prices

Denier and Filaments	Intermediate Twist 4 & 6-Lb. Cones	Intermediate Twist 4 & 6-Lb. Beams	Spinning Twist Cones	Spinning Twist Beams
55/15	$1.17	$1.18	$1.11	$1.12
75/20	1.14	1.15	1.08	1.09
100/26	1.08	1.09	1.02	1.03
120/40	.99	1.00	.93	.94
150/40	.91	.92	.86	.87
200/52	.85	.86	.81	.82
300/80	.81	.82	.77	.78
450/120	.79	.80	.75	.76
600/160	.77	.78	....	....
900/80	.74	....	....	....

3 to 5 Turns on Cones or Beams — $.02 Additional

Terms: Net 30 days. Prices per pound F.O.B. shipping point, lowest transportation allowed to destination in U.S.A. east of the Mississippi River.

Prices subject to change without notice.

All previous prices withdrawn.

Note: Prices on unlisted items can be obtained upon request.

E. I. du Pont de Nemours & Co.

Textile Fibers Dept.

Current Prices

Acetate

Denier & Filament	Zero Twist Tubes	Zero Twist Beams	Low Twist Cones	Low Twist Beams	Intermediate Twist 2 & 4 Lb. ⅝" Tbs.	Intermediate Twist 4 & 6 Lb. Tw. Tbs.	Intermediate Twist Cones	Intermediate Twist Bms.
45-13	$1.10	$1.11	$1.11	$1.12			$1.17	$1.18
45-24	1.10	1.11		1.12			1.17	1.18
55-18	.925	.985		.99			1.04	1.05
55-24	.925	.985		.99			1.04	1.05
75-8	.94							
75-24	.84	.94	.94	.95		$.98	1.00	1.01
75-50	.89			.97		1.00	1.02	1.03
100-11	.90		1.04				1.04	
100-24	.81		.89	.90		.93	.95	.96
100-32	.81		.89	.90		.93	.95	.96
100-66	.83					.95	.97	.98
120-40	.77	.80	.80	.81		.85	.86	.87
120-50	.77	.80	.80	.81		.85	.86	.87
150-16	.72				$.81	.81	.81	.82
150-40	.69	.72	.72	.73	.77	.77	.77	.78
200-60	.68		.69	.70	.73	.73	.73	.74
240-80			.67				.71	
300-40	.63							
300-80	.63	.65	.65	.66	.69	.69	.69	.70
450-120	.63		.63	.64	.67	.67	.67	.68
600-80							.65	
600-160			.62	.63	.65	.65	.65	.66
900-44	.61		.62	.63	.63	.63	.63	.64
900-70	.61		.62	.63	.63	.63	.63	.64
900-240			.62	.63	.63	.63	.63	.64
1800-88			.60	.61	.61	.61	.61	.62
1800-140			.60	.61	.61	.61	.61	.62
2700-132			.60	.61	.61	.61	.61	.62
2700-210			.60	.61	.61	.61	.61	.62
3000-210					.61	.61	.61	.62
3200-160					.61	.61	.61	.62

(A) Regular Twist (2.9 thru 5 T.P.I.)—add $.02 to Intermediate Twist Price.

(B) 1 lb. ⅝" Tubes—add $.02 to 2 & 4 lb. ⅝" Tube Price.

(C) 2 lb. Twisted Tubes are the same as 4 & 6 lb. tubes except on 150, 200 and 300 denier Intermediate Twist where the price is $.01 less.

Color-Sealed

Denier & Filament	Zero Twist Tubes	Zero Twist Beams	Low Twist Cones	Low Twist Beams	Intermediate Twist Twisted Tubes 2 Lb.	Intermediate Twist Twisted Tubes 4 & 6 Lb.	Intermediate Twist Cones	Intermediate Twist Beams
55-18	$1.245	$1.315		$1.32	$1.35	$1.35	$1.37	$1.38
75-24	1.18	1.28	$1.28	1.29	1.32	1.32	1.34	1.35
100-32	1.14		1.22	1.23	1.26	1.26	1.28	1.29
150-40	1.03	1.06	1.06	1.07	1.10	1.11	1.11	1.12
200-60	1.00		1.01	1.02	1.04	1.05	1.05	1.06
300-40	.95						1.01	
300-80	.95	.97	.97	.98	1.00	1.01	1.01	1.02

(A) Regular Twist—Add $.02 to Intermediate Twist Price.

(B) $.15 per lb. premium will be charged for 300 denier color-sealed items (Except Black) for quantities less than 1000 lbs. per item or the nearest full case.

Black

Denier & Filament	Zero Twist Tubes	Zero Twist Beams	Low Twist Cones	Low Twist Beams	Intermediate Twist 2 & 4 Lb. ⅝" Tbs.	Intermediate Twist 4 & 6 Lb. Tw. Tbs.	Intermediate Twist Cones	Intermediate Twist Beams
55-18	$1.045	$1.115		$1.12		$1.15	$1.17	$1.18
75-24	.98	1.08	$1.08	1.09		1.12	1.14	1.15
100-32	.94		1.02	1.03		1.06	1.08	1.09
150-40	.83	.86	.86	.87		.91	.91	.92
200-60	.80		.81	.82		.85	.85	.86
300-40	.75	.77	.77	.78	$.81	.81	.81	.82
300-80	.75	.77	.77	.78	.81	.81	.81	.82
450-120			.75	.76	.79	.79	.79	.80
600-160			.73	.74	.77	.77	.77	.78
900-44	.72		.73	.74	.74	.74	.74	.75
900-70	.72		.73	.74	.74	.74	.74	.75
900-240			.73	.74	.74	.74	.74	.75

(A) Regular Twist (2.9 thru 5 T.P.I.)—add $.02 to Int. Twist Price.

(B) 1 lb. ⅝" Tubes—add $.02 to 2 & 4 lb. ⅝" Tube Price.

(C) 2 lb. Twisted Tubes are the same as 4 & 6 lb. Twisted Tubes except on 150, 200 and 300 denier Intermediate Twists where the price is $.01 less.

Specialty Yarns

Type 20	Same Price as Regular Yarn
Type C	Same Price as Regular Yarn
Type C—Thick & Thin	
100-22	Int. Twist 4 lb. Cones $1.39

Denier & Filament	Natural Cones	Natural Beams	Black Cones	Black Beams	Color-Sealed Cones	Color-Sealed Beams
100-22 Int. Twist	$1.36					
200-64 Int. Twist	1.05		$1.15		$1.35	
200-64 Reg. Twist	1.08	$1.09	1.17	$1.21		
300-80 Int. Twist	1.00					

Terms: Net 30 days. Subject to change without notice.

Domestic Freight Terms are F.O.B. shipping point, freight prepaid our route to points east of the Mississippi River within the continental limits of the United States, for points west of the Mississippi River freight allowed to the Mississippi River crossing nearest purchaser's mill if shipped overland, or port of exit of purchaser's choice east of Mississippi River.

Eastman Chemical Products, Inc.

Tennessee Eastman Co.

Effective December 21, 1956

Estron Yarn, Bright or Dull — White

Denier & Filament	Regular Twist Cones	Intermediate Twist Cones	Intermediate Twist Tubes	Intermediate Twist Beams	Low Twist Cones	Low Twist Beams	Zero Twist Tubes	Tricot Beams Span Twist	Tricot Beams Zero Twist
55/13	$1.06	$1.04	$1.02	$1.05	$.98	$.99	$.92½	$.99	$.98½
75/19	1.02	1.00	.98	1.01	.94	.95	.84	.95	....
75/49	1.04	1.02	....	1.03	....	....	....	....	....
100/25	.97	.95	.93	.96	.89	.90	.81	....	....
120/30	.90	.88	.86	.89	.82	.83	....	....	....
150/38	.79	.77	....	.78	.72	.73	.69	....	....
200/50	.75	.73	....	.74	.69	.70	....	....	....
300/75	.71	.69	....	.70	.65	.66	.63	....	....
450/114	.69	.67	....	.68	.63	.64	....	....	....
600/156	.67	.65	....	.66	.62	.63	.63	....	....
900/230	.65	.63	....	.64	....	....	.61	....	....
Heavier	....	....	....	....	....	....	.56	....	.56

Current Prices—December 19, 1955

Chromspun—Standard Colors (Except Black)

Denier & Filament	Regular Twist Cones	Regular Twist Beams	Intermediate Twist Cones	Intermediate Twist Beams	Low Twist Cones	Low Twist Beams
55/13	$1.39	$1.40	$1.37	$1.38	$1.31	$1.32
75/19	1.36	1.37	1.34	1.35	1.28	1.29
100/25	1.30	1.31	1.28	1.29	1.22	1.23
150/38	....	....	1.11	1.12	1.06	1.07
300/75	....	....	1.01	1.02	.97	.98
450/114	....	....	.99	1.00	.95	.96
900/230	....	....	.94	.95	....	....

Current Prices

Chromspun—Black

Denier & Filament	Regular Twist Cones	Intermediate Twist Cones	Intermediate Twist Beams	Low Twist & Spun Twist Beams
55/13	$1.19	$1.17	$1.18	$1.12
75/19	1.16	1.14	1.15	1.09
100/25	1.10	1.08	1.09	1.03
150/38	.93	.91	.92	.87
200/50	.87	.85	.86	.82
300/75	.83	.81	.82	.78
450/114	.81	.79	.80	.76
900/230	.76	.74	.75	....

Prices are subject to change without notice.

Prices on special items quoted on request.

Terms: Net 30 days. Payment—U. S. A. dollars.

Transportation charges prepaid or allowed to destination in the United States east of Mississippi River. Seller reserves right to select route and method of shipment. If Buyer requests and Seller agrees to a route or method involving higher than lowest rate Buyer shall pay the excess of transportation cost and tax.

RAYON STAPLE and TOW

American Viscose Corp.

Current Prices

Rayon Staple

	Bright and Dull
Regular	$ .32
Extra Strength	
1.0 Denier	.34
"Viscose 32A"	.36
"Avisco Crimped"	
1.25 Denier	.34
3.0 & 5.5 Deniers	.33
8.0 & 15.0 Deniers	.35
"Avisco Smooth"	
8.0, 15.0 & 22.0 Deniers	.37
Short Staple Blend	.34

Rayon Tow

Grouped Continuous Filaments (200,000 Total Denier)	
1.5, 3.0 & 5.5 Denier Per Filament	.34
9.0 Denier Per Filament	.36
Grouped Continuous Filaments (4400/300 & 2000/1500)	.65

Prices of other descriptions on request.

Terms: Net 30 days.

Celanese Corp. of America

Current Prices

Rayon Tow

	Bright & Dull
1.5, 3, 5 D.P.F.	.34
8 D.P.F.	.36

Courtaulds (Alabama) Inc.

Effective April 23, 1956

Rayon Staple

	Bright	Dull
1½ and 3 denier	$.31	$.31

Available in 1⅛", 1-9/16" and 2".

"Coloray" Spun Dyed Rayon Staple

	1½ Den. 1-9/16"	3 Den. 2"	4½ Den. 6"	Price per Lb.
	(Code numbers for color and denier)			
Black	1404	1419	1425	37¢
Tan	8004	8019	8025	39¢
Medium Brown	8804	8819	8825	39¢
Silver Grey	1004	1019	1025	39¢
Terra Cotta	8204	8219	8225	39¢
Khaki	3004	3019	3025	40¢
Dark Brown	8604	8519	8525	40¢
Slate Grey	0804	0819	0825	43¢
Light Blue	4004	4019	4025	44¢
Sulphur	2004	2019	2025	44¢
Apple Green	5104	5119	5025	45¢
Peacock Blue	4604	4619	4625	46¢
Medium Blue	4204	4219	4225	48¢
Dark Blue	4404	4419	4425	49¢
Hunter Green	5404	5419	5425	49¢
Indian Yellow	2504	2519	2525	49¢
Pink	6004	6019	6025	50¢
Turquoise	4804	4819	4825	50¢
Malachite Green	5204	5219	5225	51¢
Red	7004	7019	7025	56¢

(In addition to the above, Black is also available in:
1½ den. 1⅛" (1401) 3 den. 1-9/16" (1416) 4½ den. 2"
3 den. 1⅛" (1413) 3 den. 2⅛" (1420) 4½ den. 4")

Terms: Net 30 days, f.o.b. LeMoyne, Alabama. Minimum transportation allowed to points in U.S.A. east of Mississippi River.

The Hartford Rayon Co.
Div. Bigelow-Sanford Carpet Co., Inc.

Rayon Staple

Effective February 8, 1956

REGULAR

1.5 denier Bright
1½" and 2" ..... 32¢

VISCALON 66 (Crimped)

8 denier 2" Bright ..... 35¢
15 denier 3" Bright ..... 35¢
15 denier 3" Dull ..... 35¢

"KOLORBON"—Solution Dyed Rayon Staple

	8 Denier Bright	15 Denier Dull	15 Denier Bright
Cloud Grey	45¢	45¢	....
Sandalwood	45¢	45¢	....
Nutria	45¢	45¢	....
Sea Green	45¢	45¢	....
Mint Green	45¢	45¢	....
Champagne	45¢	45¢	....
Cafe Brown	....	....	55¢
Midnight Black	....	....	45¢
Gold	48¢	48¢	....
Turquoise	45¢	45¢	....
Melon	48¢	48¢	....
Light Blue	45¢	45¢	....
Charcoal Grey	45¢	45¢	....

Terms: Net 30 days. Prices are quoted f.o.b. shipping point, lowest cost of transportation allowed, or prepaid. To points West of the Mississippi, lowest cost of transportation allowed to the Mississippi River crossing.

ACETATE STAPLE and TOW

Celanese Corp. of America
Current Prices

Staple

Celanese Acetate Staple	Bright & Dull
2, 3, 5.5 & 8 Individual Deniers	$.32
12 & 17 Individual Deniers	.33
35 & 50 Individual Deniers	.36
⅜" to ⅞" cut length (all deniers)—Premium	.03
Variable Acetate Fibers	.30
35 Individual Denier Flat Filament Acetate	.38

Tow

Celanese Celatow Acetate	Bright & Dull
2, 3, 5.5 & 8 Individual Deniers	$.34
12 & 17 Individual Deniers	.35
35 & 50 Individual Deniers	.37

Terms: Net 30 days. Prices per pound F.O.B. shipping point, lowest transportation allowed to destination in U.S.A. east of the Mississippi River.

Prices subject to change without notice.
All previous prices withdrawn.

NON CELLULOSIC YARN

NYLON

Allied Chemical and Dye Corporation
"Caprolan" Tensile Tough Nylon

Effective September 24, 1956

Heavy Yarns

Denier	Filament	Turn/In.	Twist	Type**	Package	Price/Lb.
2100	408	0	0	HB	Paper Tube*	$1.27
2100	112	0	0	HB	Paper Tube	1.30
2500	408	0	0	HB	Paper Tube	1.27
2500	112	0	0	HB	Paper Tube	1.30
3360	544	0	0	HB	Paper Tube	1.26
3360	168	0	0	HB	Paper Tube	1.29
4200	680	0	0	HB	Paper Tube	1.26
4200	224	0	0	HB	Paper Tube	1.29
5000	816	0	0	HB	Paper Tube	1.25
5000	280	0	0	HB	Paper Tube	1.28
7500	1224	0	0	HB	Paper Tube	1.24
10,000	1632	0	0	HB	Paper Tube	1.24
15,000	2448	0	0	HB	Paper Tube	1.23

Terms—Net 30 days.
These prices are subject to change without notice. All prices are quoted F.O.B. shipping point.
Lowest freight cost prepaid or allowed east of Mississippi River.
* Paper Tubes non-returnable, no charge. Standard Put-up: 10 lb. package.
** Type is used to describe luster and tenacity.
Type HB: High Tenacity, Bright.

American Enka Corporation
Nylenka Filament Yarn Prices

Effective December 21, 1956

Denier & Filament	Twist	Luster	Tenacity	Package	Yarn Weight per Package	Price per Pound, Std.	Price per Pound, Sub.
15/1	0.5Z	semi-dull	Normal	Pirn	1 lb.	$5.25	$5.00
30/6	0.5Z	semi-dull	Normal	Pirn	2 lb.	2.36	2.21
40/8	0.5Z	semi-dull	Normal	Pirn	2 lb.	2.01	1.81
50/13	0.5Z	semi-dull	Normal	Pirn	2 lb.	1.91	1.76
100/24	0.5Z	semi-dull	Normal	Pirn	2 lb.	1.65	1.60
100/32	0.5Z	semi-dull	Normal	Pirn	2 lb.	1.65	1.60
200/34	0.5Z	bright	Normal	Pirn	2 lb.	1.49	1.44
200/34	0.5Z	bright	Normal	Cone	4 lb.	1.49	1.44
210/34	0.5Z	bright	High	Pirn	2 lb.	1.49	1.44
210/34	0.5Z	bright	High	Cone	4 lb.	1.49	1.44
840/140	0.5Z	bright	High	Pirn	2 lb.	1.30	1.20
840/140	0.5Z	bright	High	Cone	4 lb.	1.30	1.20
840/140	0.5Z	bright	High	Beam	—	1.30	1.20

Pirns charged at $.25 each. Deposit refunded upon return of pirn in good condition. Cones are non-returnable. Beams and cradles are deposit carriers and remain property of American Enka Corporation.
Terms: Net 30 days. Minimum common carrier transportation charges will be prepaid and absorbed to the first destination on or east of the Mississippi River. In prepaying transportation charges, seller reserves the right to select the carrier used.

The Chemstrand Corp.
Current Prices

Effective December 19, 1956

Denier	Filament	Twist	Type*	Package	Standard	Second
10	1	O	SD	Bobbins	$8.42	$7.81
15	1	O	SD	Bobbins	5.25	5.00
15	1	O	D	Bobbins	5.30	5.00
15	1	O	D	Spools	5.41	....
30	10	Z	SD	Bobbins	2.36	2.21
30	10	Z	HSD	Bobbins	2.36	2.21
30	26	Z	SD	Bobbins	2.49	2.21
40	7	Z	SD	Bobbins	2.11	1.75
40	13	Z	SD	Bobbins	2.01	1.81
40	13	Z	SD	Spools	2.11	....
40	13	Z	D	Bobbins	2.06	1.81
40	13	Z	D	Spools	2.16	....
40	13	Z	RD	Bobbins	2.06	1.81
40	13	Z	RD	Spools	2.16	....
50	17	Z	SD	Bobbins	1.91	1.76
70	34	Z	SD	Bobbins	1.71	1.66
70	34	Z	B	Bobbins	1.71	1.66
70	34	Z	D	Spools	1.86	....
80	26	Z	SD	Bobbins	1.71	1.56
100	34	Z	SD	Bobbins	1.65	1.60
100	34	Z	HB	Bobbins	1.70	1.60
140	68	Z	SD	Bobbins	1.60	1.55
200	34	Z	B	Bobbins	1.49	1.44
200	68	Z	SD	Bobbins	1.56	1.46
210	34	Z	HB	Bobbins	1.49	1.44
210	34	Z	HB	Spools	1.54	....
210	34	Z	HB	Beams	1.54	....
260	17	Z	HB	Bobbins	1.49	1.39
260	17	Z	HB	Spools	1.54	....
420	68	Z	HB	Bobbins	1.39	1.29
630	102	Z	HB	Bobbins	1.39	1.29
840	136	Z	HB	Bobbins	1.34	1.24
840	136	Z	HB	Tubes	1.34	1.24
840	140	Z	HB	Beams	1.30	1.20
840	140	Z	HB	Tubes	1.30	1.20

**Types*: D—Dull; SD Semi-dull; B—Bright; H—High tenacity.
Bobbins are invoiced at 25¢ or 45¢ each, depending on type; tubes are invoiced at 40¢ each; spools invoiced at $77.00 and $95.00 depending on type; and beams and crates for beams are invoiced at $220 and $25 respectively.
Prices subject to change without notice.

E. I. du Pont de Nemours & Co.

Textile Fibers Dept.

Current Prices

Nylon Yarn

Denier & Filament	Turns/Inch & Twist	Type	Package	1st Grade	2nd Grade
7-1	0	200	Bobbin	$9.47	$8.82
10-1	0	200	Bobbin	8.42	7.82
12-1	0	200	Bobbin	7.35	6.85
15-1	0	200	Tricot Bms.	5.36	....
15-1	0	200	Bobbin	5.25	5.00
15-1	0	680	Tricot Bms.	5.41	....
15-1	0	680	Bobbin	5.30	5.00
20-1	0	200	Bobbin	4.42	4.12
20-7	0.5Z	200	Bobbin	2.91	2.61
20-7	0.5Z	680	Bobbin	2.96	2.61
20-20	0.7Z	209	Bobbin	6.00	....
20-7	0.5Z	200	Tricot Bms.	3.02	....
30-10	0.5Z	200	Bobbin	2.36	2.21
30-10	0.5Z	200	Tricot Bms.	2.46	....
30-10	0.5Z	680	Bobbin	2.41	2.21
30-10	0.5Z	680	Tricot Bms.	2.51	....
30-26	0.5Z	200	Bobbin	2.49	2.21
40-7	0.5Z	200	Bobbin	2.11	1.75
40-13	0.5Z	200	Bobbin	2.01	1.81
40-13	0.5Z	200	Tricot Bms.	2.11	....
40-13	0.5Z	400	Bobbin	2.13	1.90
40-13	0.5Z	670/680	Bobbin	2.06	1.81
40-13	0.5Z	670/680	Tricot Bms.	2.16	....
40-34	0.5Z	200	Bobbin	2.21	1.81
50-17	0.5Z	200	Bobbin	1.91	1.76
50-17	0.5Z	680	Bobbin	2.01	1.76
70-17	0.5Z	200	Bobbin	1.71	1.66
70-34	0.5Z	100/200	Bobbin	1.71	1.66
70-34	0.5Z	300	Bobbin	1.76	1.66
70-34	0.5Z	680	Bobbin	1.76	1.66
80-26	0.5Z	200	Bobbin	1.71	1.56
100-34	0.5Z	200	Bobbin	1.65	1.60
100-34	0.5Z	300	Bobbin	1.70	1.60
100-34	0.5Z	680	Bobbin	1.70	1.60
100-50	0.5Z	200	Bobbin	1.71	1.60
140-68	0.5Z	200	Bobbin	1.60	1.55
140-68	0.5Z	300	Bobbin	1.65	1.55
200-34	0.7Z	100	Bobbin	1.49	1.44
200-34	0.7Z	680	Bobbin	1.54	1.44
200-68	0.7Z	200	Bobbin	1.56	1.46
210-34	0.7Z	300	Bobbin	1.49	1.44
210-34	0.7Z	300	Beam	1.54	....
260-17	1Z	100/300	Bobbin	1.49	1.39
400-68	0.7Z	100	Bobbin	1.39	1.29
420-68	1Z	300	Bobbin	1.39	1.29
780-51	0.7Z	300	Bobbin	1.39	1.29
800-140	0.5Z	100	Bobbin	1.39	1.29
840-136	1Z	300	Bobbin/Al. Tube	1.34	1.24
840-140	0.5Z	300/700	Al. Tbs/Beam	1.30	1.20

Color-Sealed Yarn

Denier & Filament	Turns/Inch & Twist	Type	Package	1st Grade	2nd Grade
70-34	0.5Z	140	Bobbin	$2.06	$2.01
200-34	0.7Z	140	Bobbin	1.84	1.79
260-17	1Z	140	Bobbin	1.84	1.79

Industrial Yarn

				Price/Lb.
2520-420	0	300/700	Paper Tube	$1.27
4200-700	0	300/700	Paper Tube	1.25
5040-840	0	300/700	Paper Tube	1.25
7560-1260	0	300/700	Paper Tube	1.24
10080-1680	0	300/700	Paper Tube	1.24
15120-2520	0	300/700	Paper Tube	1.23

These prices are subject to change without notice. Terms: Net 30 Days.

Types

Type 100—Bright, normal tenacity.
Type 140—Bright, color-sealed, black, normal tenacity.
Type 200—Semidull, normal tenacity.
Type 209—Semidull, normal tenacity.
Type 300—Bright, high tenacity.
Type 400—Semidull, high tenacity.
Type 670—Dull, normal tenacity.
Type 680—Dull, normal tenacity.
Type 700—Bright, high tenacity.

Freight Terms—Terms are F.O.B. shipping point, freight prepaid our route to points east of the Mississippi River within the continental limits of the United States, for points west of the Mississippi River freight allowed to the Mississippi River crossing nearest purchaser's mill if shipped overland, or port of exit of purchaser's choice east of Mississippi River.

Following are invoiced as a separate item.
Bobbins—25 cents or 45 cents depending on type
Aluminum Tubes—40 cents each
Tire Cord Beams—$220.00 each
Cradles for Tire Cord Beams—$115.00 each
Tricot Beams—$95.00 each
Cradles for Tricot Beams—$130.00 each
(Beams and Cradles are deposit carriers and remain the property of E. I. du Pont de Nemours & Co., Inc.)

POLYESTER

E. I. du Pont de Nemours & Co.

Textile Fibers Dept.

Current Prices

"Dacron"*

Denier & Filament	Turns/Inch	Luster	Type*	Tubes 1st Gr.
30-20	0	Dull	57	$2.86
40-27	0	Semidull	56	2.41
40-27	0	Bright	55	2.41
40-27	0	Dull	57	2.46
70-34	0	Semidull	56	$2.01
70-14	0	Bright	55	2.01
70-34	0	Bright	55	2.01
70-34	0	Dull	57	2.06
100-34	0	Semidull	56	$1.94
140-28	0	Bright	55	1.89
150-68	0	Semidull	56	1.91
220-50	0	Bright	51	1.84
250-50	0	Bright	55	1.86
1100-250	0	Semidull	59	$1.50
1100-250	0	Bright	51	1.50

Terms: Net 30 Days.

Domestic Freight Terms are F.O.B. shipping point, freight prepaid our route to points east of the Mississippi River within the continental limits of the United States, for points west of the Mississippi River freight allowed to the Mississippi River crossing nearest purchaser's mill if shipped overland, or port of exit of purchaser's choice east of Mississippi River.

Yarn Types

* Type:
Type 51—Bright, high tenacity.
Type 55—Bright, normal tenacity.
Type 56—Semidull, normal tenacity.
Type 57—Dull, normal tenacity.
Type 59—Semidull, high tenacity.

Tubes are invoiced as a separate item at $.70 each. The only exception to this is an $.80 charge on the tubes used for 30 Denier Dull. All tubes are returnable for credit.

* "DACRON" is DuPont's registered trade-mark for its polyester fiber.

NON CELLULOSIC STAPLE & TOW ACRYLIC

The Chemstrand Corp.

Current Prices

"Acrilan"

2.0 denier Semi-dull staple and tow	$1.18
2.5 denier Hi-Bulk Bright and Semi-dull staple and tow	1.12
3.0 denier Bright & Semi-dull staple and tow	1.12
5.0 denier Bright & Semi-dull staple and tow	1.12
8.0 denier Bright and Semi-dull staple and tow	1.12

Terms: Net 30 days. Freight prepaid to points east of the Mississippi River.

Carbide and Carbon Chemicals Co.

Div. Union Carbide and Carbon Corp.

Textile Fibers Dept.

Effective November 1, 1955

Dynel Staple

Natural Dynel	
3, 6, 12, and 24 Denier, Staple and Tow	$1.05 per lb.
Whitened Dynel, and Dynel Spun with Light Colors: Blonde, or Gray	
3 and 6 Denier, Staple and Tow	1.20 per lb.
Dynel Spun with Dark Colors: Black, Charcoal, and Brown	
3 and 6 Denier, Staple and Tow	1.30 per lb.

Prices are quoted f.o.b. South Charleston, W. Va.

E. I. du Pont de Nemours & Co.

Textile Fibers Dept.

Current Prices

"Orlon"** Acrylic Staple & Tow

Type 42	1st Grade
1.0 Denier Semidull & Bright—Staple only	$1.48
2.0 Denier Semidull	1.33
3.0 Denier Semidull & Bright	1.28
3.0 Denier Semidull Color-sealed Black—Staple only	1.63
4.5 Denier Semidull	1.20
6.0 Denier Semidull & Bright	1.20

Tow—Total Denier 470,000
Staple Lengths—1½", 2", 2½", 3", 4½"
High Shrinkage Staple same price as Regular Staple

Type 39 $1.06

This product is designed for *woolen system spinning* and is a blend of predominately heavy deniers (average 4.2) with a variable cut length.

F.O.B. Shipping Point—Freight prepaid our route to points east of the Mississippi River within the continental limits of the United States, for points west of the Mississippi River freight allowed to the Mississippi River crossing nearest purchaser's mill if shipped overland, or port of exit of purchaser's choice east of Mississippi River.

Terms: Net 30 Days.

** "ORLON" is DuPont's registered trade-mark for its acrylic fiber.

Eastman Chemical Products, Inc.
Tennessee Eastman Co.

Effective November 15, 1956

Verel

Deniers	Dull and Bright
2, 3, 5 and 8	$1.10 per pound

Prices are subject to change without notice.

Terms: Net 30 days. Payment—U. S. A. dollars.

Transportation charges prepaid or allowed to destination in the United States east of the Mississippi River. Seller reserves the right to select route and method of shipment. If buyer requests and seller agrees to a route or method involving higher than lowest rate buyer shall pay the excess of transportation cost and tax.

NYLON

American Enka Corp.

Nylenka (Nylon Six Staple)

Denier	Luster	Length (Inches)	Price per pound
3	semi-dull	1½, 1½, 2, 2⅝, 3, 4½	$1.28
6	bright	3, 4½	1.28
8	bright	2⅝	1.20
10	bright	3	1.20
15	bright	3	1.20

Deniers and lengths of staple not listed above are available upon special request.

Terms: Net 30 days. Minimum common carrier transportation charges will be prepaid and absorbed to the first destination on or east of the Mississippi River. In prepaying transportation charges, seller reserves the right to select the carrier used.

Chemnyle Process

(Continued from Page 83)

2% Triton X-67 and formic acid to provide a pH of approximately 3.5%. The recommended dyestuff solution is added to the bath and the dyeing is carried out at 190°-200°F in conventional fashion. After color matching, the dyeing is washed off at 160°F. If 160°F washfastness is required, the goods should be aftertreated in the recommended fixing agent for the specific dyestuffs. Katanol 0-50 and Chromofix B are among those found to be of advantage. Chrome dyestuffs may be used to great advantage in shades ranging from light medium to black. The colors are chromed by conventional methods to give good washfastness at temperatures ranging from 160°F to the boil.

The question of dyestuff selection is of paramount importance, for it has been established that there are what may be classified as slow, medium and fast drawing colors and, although it is preferable to use dyestuffs from a given classification mixtures of slow and medium, and medium and fast drawing types are permissible. Interestingly, rates of drawing of individual dyestuffs may be entirely different under Chemnyle conditions from those under normal dyeing conditions. It is also interesting to note that all types of the selected dyestuffs which may be direct, milling or acid dyestuffs are applied from the same amount of formic acid.

Dyestuff selection is also very important from the standpoint of colorfastness, both to light and washing, and it should be pointed out that the use of the Chemnyle process is not an automatic guarantee of good fastness.

Work up to this point shows without equivocation that wetfastness of a very high order produced on filament nylon. With regard to light fastness, in the main, thus far, it can be said that selected chrome type dyestuffs give lightfastness from 20-100 Fade-Ometer hours. A number of neutral dyeing premetalized types have also been found capable of application by the Chemnyle method.

A development not previously disclosed is the fact that certain optical bleaches may be applied by the Chemnyle process to give extremely uniform results, whereas application under normal conditions showed the same non-uniformities associated with acid dyestuffs. This development may also have far reaching importance as whites have hitherto presented serious problems.

That the dyeing industry was eagerly waiting for such a development is shown by the fact that over one hundred dyeing and finishing companies have already made application for a license to use the Chemnyle process. It is believed that the formalities connected with licensing are almost completed, at which point Chemstrand dyeing technicians will be available for plant demonstrations. The dyeing assistant will be made available at a cost of approximately 40 cents per pound in drum quantities.

Flat Speed on Whitin Card

In the January issue of this magazine, it was stated on page 46 that the flat speed on a Whitin Model L flat card processing 1.0 denier Orlon acrylic fiber should be three feet per minute. The Du Pont Co., which furnished this information, has pointed out that it is erroneous. The correct speed of the flats should be three inches per minute.

E. I. du Pont de Nemours & Co.

Textile Fibers Dept.
Current Prices

Nylon Staple and Tow

Denier	Type	Staple Lengths	Tow Bundle	Price/Lb.
1.5	200	1⅛"—4½"	None made	$1.33
1.5	201	1⅛"—4½"	None made	1.35
3.0	100/200	1⅛"—4½"	430M	1.28
3.0	101/201	1⅛"—4½"	455M	1.30
6.0	100	1⅛"—4½"	330M	1.28
6.0	101	1⅛"—4½"	345M	1.30
15.0	100	1½"—6½"	330M	1.20
15.0	101	1½"—6½"	None made	1.22

Staple lengths are restricted to the range shown opposite each denier above. The actual cut lengths within these ranges are as follows:

1⅛, 1½, 2, 2½, 3, 4½ and 6½

Types

Type 100 Bright, normal tenacity, not crimpset.
Type 101 Bright, normal tenacity, crimpset.
Type 200 Semidull, normal tenacity, not crimpset.
Type 201 Semidull, normal tenacity, crimpset.
These prices are subject to changes without notice.
Terms—Net 30 Days.
Freight Terms—Terms are F.O.B. shipping point, freight prepaid our route to points east of the Mississippi River within the continental limits of the United States, for points west of the Mississippi River freight allowed to the Mississippi River crossing nearest purchaser's mill if shipped overland, or port of exit of purchaser's choice east of Mississippi River.

Industrial Rayon Corp.

Effective November 29, 1956

Nylon Staple

1.5 denier	$1.33 per lb.
2, 3 and 6 denier	1.28 per lb.
8 and 15 denier	1.20 per lb.

Bright and semi-dull, required length.
Terms: Net 30 days f.o.b. point of shipment; title to pass to buyer on delivery of goods to carrier. Domestic transportation charges prepaid with transportation allowed at lowest published rate to all points east of the Mississippi River.

POLYESTER

E. I. du Pont de Nemours & Co.

Textile Fibers Dept.
Current Prices

"Dacron"* Staple and Tow

Denier	Luster	Type	Length	Tow Bundle	1st Gr.
1.25	Semidull	54	1¼"-3"	....	$1.56
1.5	Semidull	54	1¼"-3"	....	1.51
3.0	Semidull	54	1¼"-4½" & Tow	375M-500M	1.41
4.5	Semidull	54	1¼"-4½" & Tow	375M-500M	1.41
6.0	Semidull	54	1¼"-4½" & Tow	375M-500M	1.41

Terms: Net 30 Days.
F. O. B. Shipping Point—Freight prepaid our route to points east of the Mississippi River within the continental limits of the United States, for points west of the Mississippi River freight allowed to the Mississippi River crossing nearest purchaser's mill if shipped overland, or port of exit of purchaser's choice east of Mississippi River.

POLYVINYL ACETATE

American Viscose Corp.

Effective October 1, 1956

"Vinyon"® Staple

3.0 denier	½" unopened	$.80 per lb.
3.0 "	1¼" unopened	.80 per lb.
3.0 "	1¼" opened	.90 per lb.
3.0 "	2" opened	.90 per lb.
3.0 "	2" unopened	.80 per lb.
5.5 "	1" opened	.90 per lb.
5.5 "	3½" opened	.90 per lb.
5.5 "	3½" unopened	.80 per lb.

Terms: Net 30 days.

PROTEIN

Virginia-Carolina Chemical Corp.

Fiber Division
Effective January 15, 1951

"Vicara" Staple

	Standard Crimp	Highly Crimped
3 Denier	$1.00 per lb.	$1.05 per lb.
5 Denier	1.00 per lb.	1.05 per lb.
7 Denier	1.00 per lb.	1.05 per lb.

Bleached "Vicara" Staple

	Standard Crimp	Highly Crimped
3 Denier	$1.10 per lb.	$1.15 per lb.
5 Denier	1.10 per lb.	1.15 per lb.
7 Denier	1.10 per lb.	1.15 per lb.

Staple length ½ to 6 in.
Supplied in staple lengths or as continuous tow (270,000 filaments).
Terms: Net 30 days.
Prices f.o.b. Taftville, Conn. on 10% moisture regain basis.

Botany Expands in Cotton

Botany Mills, Inc., has expanded its interest in cotton textiles by acquiring Smitherman Cotton Mills and related companies. Botany acquired all of the stock of eight corporations: Smitherman Cotton Mills, Fairlane Fabrics, Lumber River Cotton Mills, Greenwich Printing & Dyeing, Lancashire Textile and Processing, Allied Embroidery, Marshall Cotton Mills and Uncas Printing & Finishing.

The new group will now be known as Calvine Mills, Inc., and operated as a wholly-owned subsidiary of Botany Mills, Inc. Included in the sale were six plants located in Charlotte, Troy, and Lumberton, N.C.; New Bedford, Mass., and E. Greenwich, R.I. Calvine will complement the earlier acquisition by Botany of the Gurney group of six mills, now known as Botany Cottons, Inc.

Business Service Section

Exclusively for Business, Laboratory and Mill Services; Positions and Men Wanted; Business Opportunities; Mill Properties Wanted or For Sale; Reconditioned Machinery and Equipment, etc.

CLASSIFIED RATES
Per Inch
2 columns to the page, each column 8 inches deep

1 Inch	$8.00
2 Inches	15.00
3 Inches	22.50
4 Inches	28.00
5 Inches	35.00
6 Inches	42.00
7 Inches	49.00
8 Inches	52.00

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SIDNEY BERTNER COMPANY
Empire State Bldg. New York City
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all deniers on cones, skeins or cakes, small and large lots.
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and all others
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TEXTILE ENGINEER

Opening for Textile Engineer in process development group of textile research laboratories. Work will be in the development of processing techniques on new synthetic fibers. Position requires textile engineer with 2 to 5 years' experience in synthetic fiber processing. Permanent location in Virginia. Unlimited opportunity for qualified person. Write to Personnel Dept., The Dow Chemical Company, P. O. Box 351, Pittsburg, California.

Make Your Reservations Now!

The April Issue of MTM will preview the Knitting Arts Exhibition in Atlantic City, April 29 to May 3, 1957.

Closing date for Advertising Forms— March 5.

For advertising space in this important issue write

MODERN TEXTILES MAGAZINE
303 Fifth Ave., N. Y. 16, N. Y.

Calendar of Coming Events

Mar. 6—AATT monthly meeting. Vanderbilt Hotel, New York, N. Y.
Mar. 11-13—National Council for Textile Education, Spring meeting. Wilmington, Del.
Mar. 14—Southern Textile Methods and Standards Association meeting. Clemson House, Clemson, S. C.
Mar. 14-15—Textile Research Institute annual meeting. Hotel Commodore, New York, N. Y.
Mar. 21-23—Division of High-Polymer Physics of American Physical Society. University of Pennsylvania, Philadelphia, Pa.
Mar. 28-29—Textile Quality Control Association meeting. Clemson House, Clemson, S. C.
Apr. 3—AATT monthly meeting. Vanderbilt Hotel, New York, N. Y.
Apr. 4-6—American Cotton Manufacturers Institute annual meeting. Biltmore Hotel, Palm Beach, Fla.
Apr. 8-11—National Packaging Conference and Exposition. International Amphitheater, Chicago, Ill.
Apr. 10-12—Alabama Cotton Manufacturers Association annual meeting. Biloxi, Mo.
Apr. 23-24—National Knitted Outerwear Association annual meeting. Hotel Waldorf-Astoria, New York, N. Y.
Apr. 29—Underwear Institute annual meeting. Traymore Hotel, Atlantic City, N. J.
Apr. 29-May 3rd—Knitting Arts Exhibition. Auditorium, Atlantic City, N. J.
Apr. 29-May 3—Materials Handling Exposition. Convention Hall, Philadelphia, Pa.
May 1-2—The Fiber Society, Spring meeting. Clemson House, Clemson, S. C.
May 1-3—Cotton Manufacturers Association of Georgia annual convention, Nassau, Bahamas.

Index to Advertisers

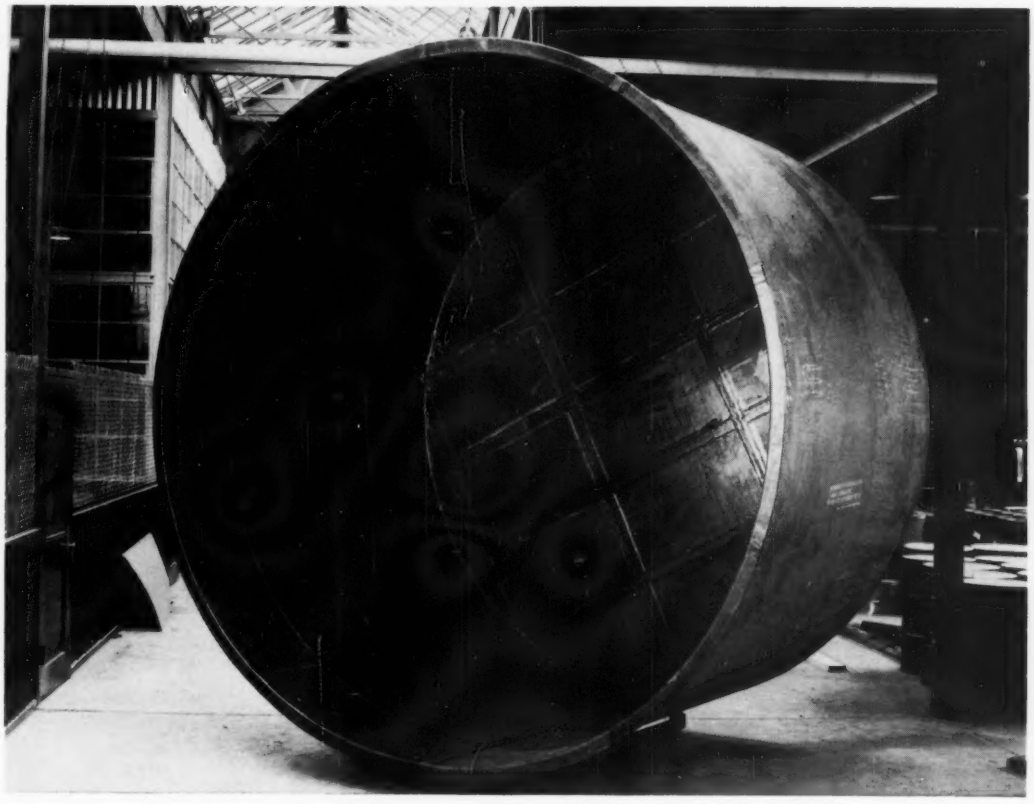
(*See previous or subsequent issues)

BUSINESS SERVICE

HERECROL

REG. U. S. PAT. OFF.

Self-curing SYNTHETIC RUBBER SHEET LINING



The CARBON STEEL TANK shown above was HERECROL lined in our shops and later installed in a Wisconsin Paper Mill for liquid alum storage. HERECROL Sheet Lining is available in ⅛" and 3/16" thickness. Application may be accomplished in the field as well as in our shop. The following is a selection of solutions which can safely be handled in HERECROL lined equipment:

ALUM SOLUTIONS • AMMONIA SOLUTIONS
COPPER SULFATE • FERRIC SULFATE
HYDROCHLORIC ACID • HYDROFLUORIC ACID
NITRIC ACID • SODIUM HYDROXIDE
PHOSPHORIC ACID • NICKEL SULFATE
ZINC CHLORIDE • ZINC SULFATE

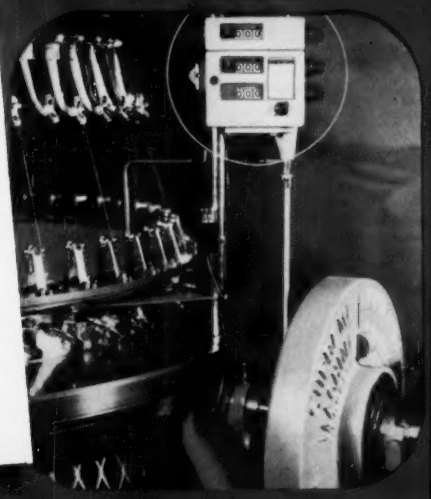
The HERECROL Self-Curing Synthetic Rubber Sheet Lining can be applied to steel tanks and o her equipment unlimited in size. The reason for this is that no special equipment to provide heat or pressure is required. Storage tanks, processing vessels, tank cars, trailer tanks, pipes, fans, blowers, and duct systems have been successfully processed.

HERESITE & CHEMICAL COMPANY

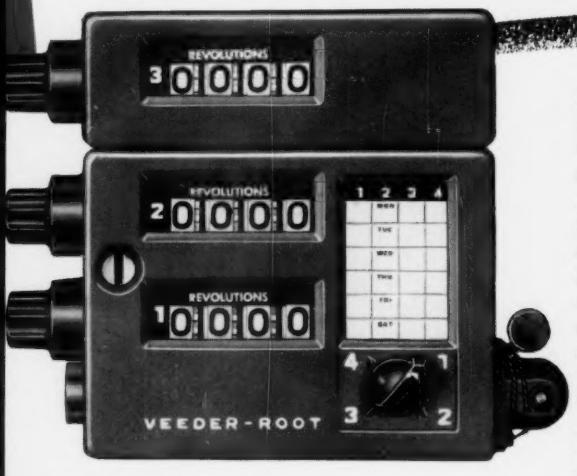
Manitowoc, Wisconsin

Eastern Division: 546 South Avenue, Garwood, New Jersey

In KNITTING
(as in Weaving and Spinning) you have to COUNT to get Accurate COUNTROL of Production and Costs



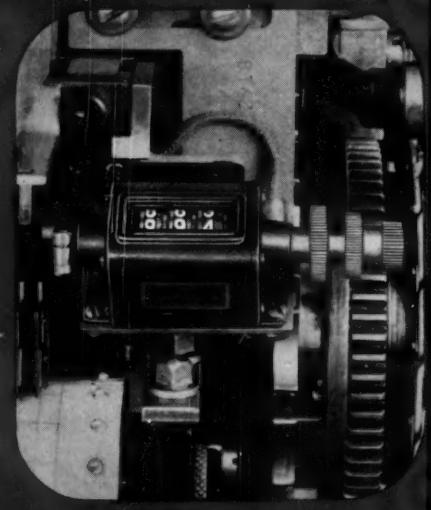
3-shift Revolution Counter on Supreme Knitting Machine.



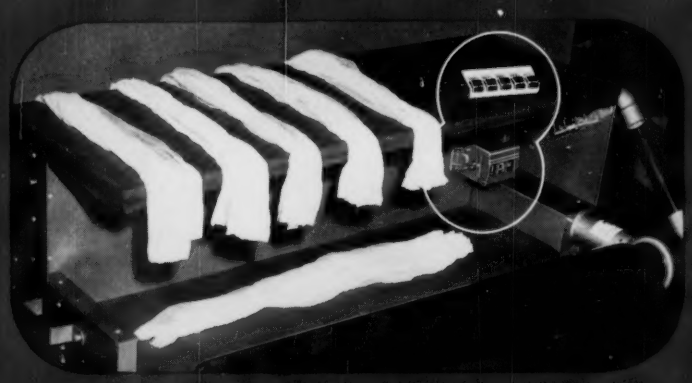
3-Shift Revolution Counter.

Every knitting machine . . . in fact, every process in every knitting mill . . . needs to be under a modern system of Veeder-Root *Countrol*. This system can be shaped to your own needs . . . so you will have a continuous, up-to-the-minute check on production scheduling . . . costs . . . quality . . . lengths . . . over-runs . . . shortages . . . and any other facts in figures you may need.

Remember, paperwork doesn't mean a thing, *unless you have accurate Countrol*. And you can count on Veeder-Root to help you in every possible way. Write:



Small Subtractive Predetermining Counter on Philadelphia Jacquard Knitting Machine.



Vary Tally and Large-Figure Hosiery Dozens Counter on Specialty Mfg. Company's "Inspectomatic" Table.

Small Reset Ratchet Counter on Textile Machine Works' full-fashioned hosiery machine.

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